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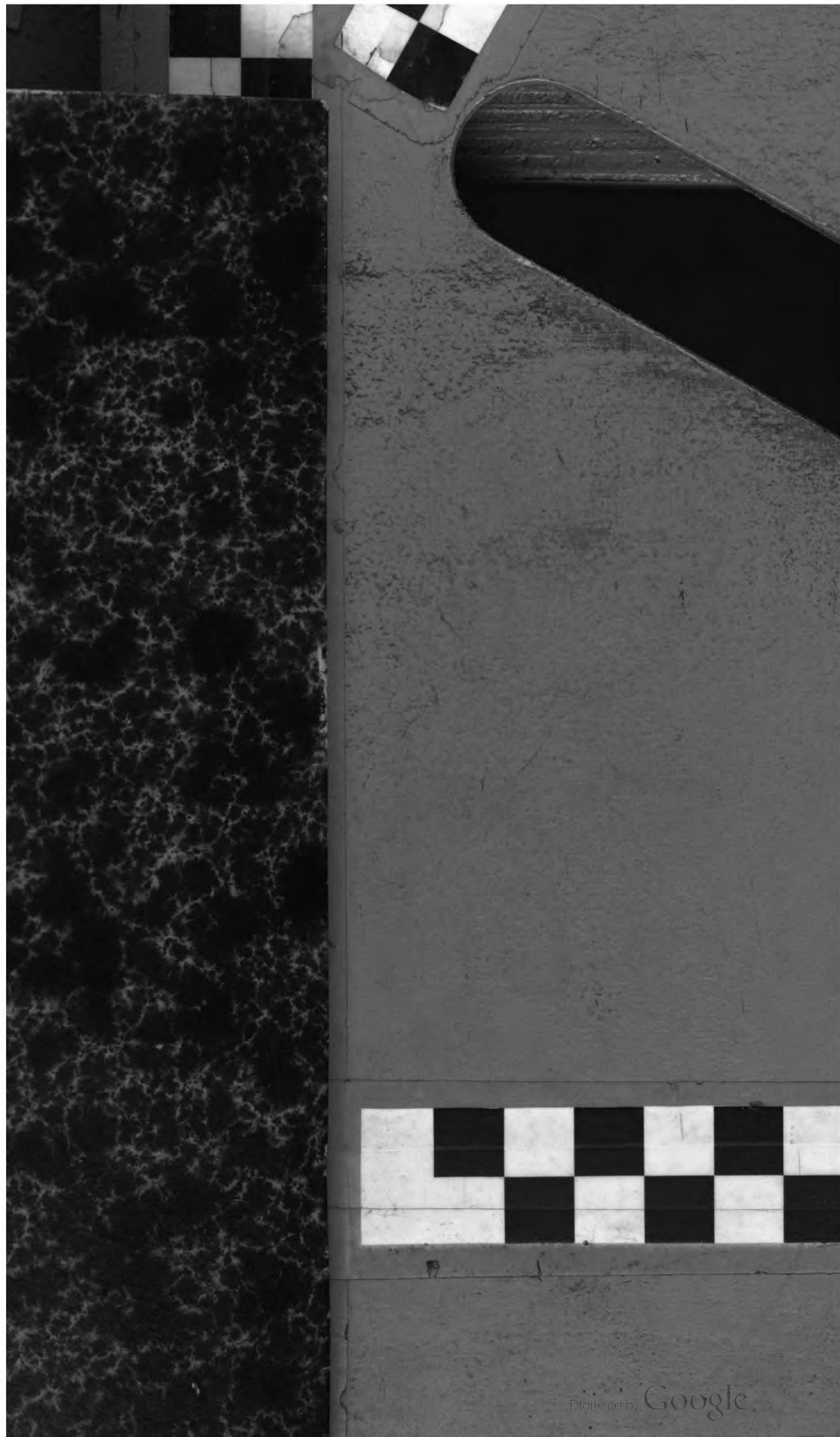
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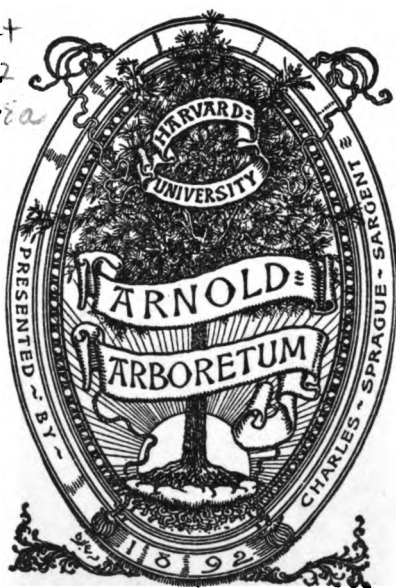
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U.S. - Congress - House - Committee

DR. HENRY PERRINE—TROPICAL PLANTS.

[To accompany bill H. R. No. 553.]

IN THE HOUSE OF REPRESENTATIVES, March 8, 1838.

Ordered, That five thousand copies, extra, be printed of the report of the Committee on Agriculture, on the memorial of Dr. Henry Perrine, in relation to the culture of tropical plants, for the use of the members of the House.

FEBRUARY 17, 1838.

Mr. DEBERRY, from the Committee on Agriculture, made the following

REPORT:

The Committee on Agriculture, to which was referred the memorial of Doctor Henry Perrine, late consul at Campeachy, asking a grant of land in the southern extremity of East Florida, for the encouragement of the growth of new and important agricultural products, exotic vegetables, and tropical plants, have had the same under consideration, and report:

The memorialist sets forth in his petition that, in the year 1827, while he was acting consul of the United States at Campeachy and Tabasco, he was officially instructed, by the circular of the Treasury Department of the 6th of September of that year, to aid the desires of the General Government to introduce into the United States all such foreign trees and plants, of whatever nature, as may give promise, under proper cultivation, of flourishing and becoming useful. That, in obedience to said circular, the time, labor, and funds of the memorialist were devoted to that purpose, by which he obtained and transmitted to this country much useful information concerning various valuable plants which may be successfully domesticated in the United States; and that, in discharging these governmental duties, he was obliged to sacrifice all opportunities of making money by his profession, or by mercantile pursuits, which, in the same period and region, had furnished fortunes to his unofficial countrymen; and, as funds not been appropriated by Government to promote the objects of the said Treasury circular, the perquisites of his consulate did not defray one-third of his personal expenses; and, as a reward for his sacrifices, and a premium to encourage the introduction and culture of tropical plants in the United States, he asks of Congress a township of land in the southern extremity of East Florida, which, in soil, climate, and geographical position, for the enterprise, he thinks affords the most favorable location, by means of gardens or nurseries, to contain all tropical vegetables of utility or ornament, which, after due seasoning

Thomas Allen, print.

may thence be gradually transplanted and acclimated throughout the Territory; and thus be ultimately extended over the adjoining States on the Gulf of Mexico and the Atlantic ocean.

The memorialist enumerates, among the exotics which may be introduced and naturalized in this country successfully, the beautiful and extensively useful family of the Palms, the Agaves, the shrubs for Chocolate, Coffee, and Tea; the Logwood, Fustic, Cochineal, and other Dyes of Mexico, Guatemala, and Brazil; the Cinnamon, Pimento, Ginger, and other Spices of the East and West Indies; the Mahogany, Cedar, Ebony, and other precious Woods of all parts of the world; the Bananas, Anonas, Mangoes, and other delicious Fruits; the Peruvian Bark, Sarsaparilla, Canella, and innumerable salutary Medicines for the removal of disease. *And that the extensive cultivation of a single species of Agave Sisalana will alone furnish a profitable staple to the planters of the South, and a cheap material to the manufacturers of the North; which will supply many wants of our merchant vessels, of our navy, and of our citizens in general.*

From some specimens of these plants and vegetables which were exhibited to the committee by the memorialist, they entertain the opinion that, if proper encouragement be given to their introduction and cultivation, they may conduce greatly to promote the agricultural and manufacturing interests of the United States, and the welfare of the people.

The memorialist represents that a tropical climate extends into Southern Florida—which opinion seems to be well established by the annexed Meteorological Table of Observations made at Indian Key, during the year 1836; that many valuable vegetables of the tropics do actually propagate themselves in the worst soils and situations in the sun and in the shade of every tropical region, where they arrive either by accident or by design; and that for other profitable plants of the tropics, which require human skill and care, *moisture* is the equivalent to *manure*; and that *tropical cultivation* essentially consists in *appropriate irrigation*, which, in such a climate, goes far to counterbalance the sterility of the soil.

The memorialist being a man of science and untiring industry, and having familiarized himself with botanical studies, and devoted much of his time and pecuniary resources for the last ten or twelve years to the accomplishment of his favorite object, as stated in his memorial, afford, in the estimation of the committee, a sufficient guaranty of his faithful compliance with the terms of the proposed grant of land.

The committee also are induced to believe that the lands asked for by the memorialist are of but little value, and, if applied and improved as by him proposed, the public lands in their vicinity might be enhanced in value, and thereby no pecuniary loss would be sustained by the Government. They have, therefore, unanimously agreed to report a bill setting apart, for this object, one township of the public land south of the twenty-sixth degree of north latitude, in East Florida, upon condition of its occupancy and successful cultivation within a limited period, and under certain restrictions and conditions, as set forth in said bill.

The committee also annex a copy of a report of the Committee on Agriculture in this case, made during the first session of the twenty-second Congress, and the accompanying documents, as a part of this report; which bill and report were not then acted on.

APRIL 26, 1832.

The Committee on Agriculture, to which were referred the memorial of Dr. Henry Perrine, consul of the United States at Campeachy, and a resolution of the Legislative Council of the Territory of Florida, recommending a grant of land in that Territory for the encouragement of the growth of new and important agricultural products, exotic vegetables, and tropical plants, have had the same under consideration, and report :

The plan and object of the memorialist, Dr. Perrine, are explained in his petition, hereto annexed, and made a part of this report, (No. 1.) Dr. Perrine has been for some years the American consul at Campeachy and Tabasco. Being a man of science and industry, he has devoted a great portion of his time, for the last four years, in the collection of the most rare and valuable tropical plants, medicinal trees and fruits, dyewoods, and other productions of the Mexican States in which they abound. From the testimonials exhibited to the committee, they are satisfied that, from the extensive acquaintance of this gentleman in that country, and the high estimation in which he is held by the public authorities of Mexico, he has it in his power to obtain and import to this country the most useful and valuable acquisitions to our agriculture.

The committee do not deem it necessary to offer any remark on the subject of the practicability of such an enterprise. The history of the world shows that, in all ages and countries, trees, vegetables, grains, and plants have been successfully transplanted and domesticated from one country to another. As a general principle of action for the National Legislature, it is better to abstain from any legislation upon such subjects, leaving them to individual enterprise and exertion. There are some cases, however, in which it would be unwise and impolitic not to furnish some facilities in aid of our enterprising fellow-citizens. The Greeks and Romans obtained, at the public expense, a number of grains, vegetables, and plants, from Africa; and all the modern states of Europe have made it one of the leading considerations of national policy to promote new acquisitions to the agriculture as well as to the commerce of the country.

The United States have acquired eighteen or twenty millions of acres of land by the late treaty with Spain, now almost entirely uninhabited, the largest portion of which is incapable of producing any article now cultivated in the United States. This immense tract of land on the borders of our Union must lie unemployed and useless for many years, without some experiment such as Dr. Perrine proposes. The committee have, therefore, determined to report a bill, setting apart for this object one township of the public lands, to be granted to him and his associates, upon condition of its occupancy and successful cultivation. The committee annex to this report a number of documents and letters explanatory of the object, and showing the importance of the proposed experiment, (numbered from 2 to 7.)

The committee also annex a copy of the Treasury circular to this report, (No. 8,) and translations from a recent work on Cuba, made by the delegate from Florida, showing the extent and value of the productions of that island, and the great importance of the introduction of the same articles, as far as practicable, into this country.

To the Senate and House of Representatives of the United States in Congress assembled :

The memorial of Henry Perrine, doctor of medicine, and American consul for Campeachy and the adjacent ports in Mexico, respectfully sheweth :

That your memorialist is a native American citizen, whose official district, including the peninsula of Yucatan and State of Tabasco, embraces a section of the Mexican territory which is the most prolific in tropical vegetables of great value to agriculture, manufactures, and commerce.

That, by the circular of the Treasury Department of the 6th September, 1827, your memorialist was officially invoked to aid the desires of the General Government to introduce into the United States all such foreign trees and "plants, of whatever nature, as may give promise, under proper cultivation, of flourishing and becoming useful."

That, in obedience to said circular, the time, labor, and funds of your memorialist were thenceforward devoted to observation and inquiry, amid the difficulties and the dangers incident to the nature of the climate and the face of the country, and the jealousies and the restrictions interposed by the character of the inhabitants and the despotism of the authorities.

That, fortunately, the *profession* of your memorialist afforded him the only means of purchasing favor among all ranks of a semi-barbarous people ; and that, hence, a gratuitous and politic distribution of his medical services enabled him to conquer the otherwise insuperable obstacles to the progress of every inquiring foreigner, so far as to acquire much useful intelligence, not obtainable in any other way, concerning various valuable plants which may be successfully domesticated in the United States.

That, as a necessary consequence of thus discharging this governmental task, your memorialist was obliged to sacrifice all opportunities of making money either by professional or mercantile pursuits, which, in the same period and region, have furnished fortunes to his unofficial countrymen ; and as funds were not appropriated by Government to promote the objects of its circular, and as the perquisites of his consulate did not defray one-third of his personal expenses, his unaided individual labors have hitherto been of comparatively little practical utility to his country, in consequence of the difficulties, disappointments, and expenses connected with the collection and transmission of living vegetables.

That, hence, when your memorialist became hopeless of the General Government's engaging directly in the important enterprise of domesticating tropical plants in the United States, he, in a letter to the Secretary of the Treasury of the 8th November last, respectfully suggested the propriety of forming an incorporated company in Florida for that purpose ; that, hence, the Governor of that Territory, in his message to the Legislative Council of the 2d ultimo, recommended an act of incorporation for your memorialist and his associates ; and that on the — ult., the Tropical Plant Company was instituted by a law, which names both associates and trustees among the most distinguished residents of that peninsula.

That your memorialist now most respectfully asks of Congress a township of land in the southern extremity of East Florida, which can never be of any value either to Government or to your memorialist, without previous heavy expenditures in improvements either upon or around it, but

which he is willing to accept as an equivalent for his past services, or for his future services, as a premium "to encourage the introduction and promote the culture of" tropical plants; since this grant, with his special intelligence, will enable him to secure that leading and permanent participation in this important enterprise which he believes essential to the speedy, spirited, and persevering progress of the present or any other association, to its zealous, liberal, and patriotic measures, to its ultimate accomplishment of the greatest possible national advantages, and to the consequent elevation of his name to the list of benefactors of his country.

That, in the opinion of your memorialist, the southern extremity of the peninsula of Florida, in soil, climate, and geographical position, affords the only suitable location for the commencement of the aforesaid enterprise, by means of a garden or nursery to contain all tropical vegetables of utility or ornament, which, after due seasoning, may thence be gradually transplanted and acclimated throughout the Territory, and thus be ultimately extended over the adjoining States on the Gulf of Mexico and the Atlantic ocean; and that, in this way, your memorialist firmly believes almost every valuable tropical vegetable may be finally domesticated in all our Southern States, with the great encouragement afforded by the general fact *that most articles of culture flourish best at the more temperate margins of their native zone.*

That, hence, your memorialist confidently anticipates the naturalization of all exotics whose qualities may render them desirable denizens of our free and industrious republic; among which he may name the very beautiful and extensively useful family of the Palms, whose diversified products embrace every thing that is essential to the subsistence and comfort of man; the Liliaceous groups, including the Agaves, in his estimation, rank next in their manifold utility to the human race; the shrubs for chocolate, coffee, and tea, which have become articles of necessity in civilized life; the logwood, fustic, cochineal, and other dyes of Mexico, Guatemala, and Brazil; the cinnamon, pimento, ginger, and other spices of the East and West Indies; the mahogany, cedar, ebony, and other precious woods of all parts of the world; the bananas, anonas, mangoes, and numerous delicious fruits for the enjoyment of health; the Peruvian bark, sarsaparilla, canella, and innumerable salutary medicines for the removal of disease.

That, in the opinion of your memorialist, the domestication of the species of a single genus of tropical plants will cause a great revolution in the agriculture of the Southern States, which will not only effectually relieve their present embarrassments, but will also give a productive value to their ruined fields and most steril districts; and that the extensive cultivation of a single species (the Agave Sisalana) alone, will furnish a profitable staple to the planters of the South, and a cheap material to the manufacturers of the North; which will supply many wants of our merchant vessels, of our navy, and of our citizens in general; augment our coasting trade and our foreign commerce; and thus contribute greatly to the prosperity and perpetuity of the Union.

That your memorialist, therefore, most respectfully trusts that, either as an equivalent for his past sacrifices, as a reward for his communicated information, as an encouragement for his future services, or as a consideration for all combined, the prayer of this memorial will be granted: especially as the land in that section of Florida will not otherwise, in many

years, be of any productive importance to Government; as the settlement of the tract will, from its location, be attended with numerous privations and expenses, which cannot be compensated by a gift of the soil; and as the adjacent territory, in consequence of this very settlement, must speedily acquire a value which will furnish a profitable revenue to the United States.

That, to explain more fully the views and expectations of your memorialist, he refers to his various communications on file in the Treasury Department; to the annexed extract of his letter to the Secretary of the Treasury, published in the *Globe* of the 19th November last; and to the adjoining extract of his letter to Doctor Howell, of Princeton, New Jersey, published in the *Telegraph* of the 17th ultimo; also, to the subjoined manuscript testimony, (marked A,) and to the file of corroborating Spanish official documents, (marked B)

And your memorialist, &c.

HENRY PERRINE.

NEW YORK, *February 6*, 1832.

TROPICAL PLANTS.

Extract from the message of the Governor of Florida, in the Floridian of January 2.

"Hundreds of the vegetable productions of tropical climates, of great value, and some in such common use as to be considered articles of necessity, and which we now import at high cost, could be easily cultivated in any part of our Territory. Many, too tropical to flourish in West or Middle Florida, could be reared under the more genial climate of the southern part of the peninsula. The southern part of this continent, and South America and China, abound in trees, plants, herbs, and roots, possessing the most valuable properties, the use of which has been confined to the places of their production, but which could as well be produced and enjoyed by our own citizens. I herewith transmit to the Council, and respectfully invite their attention to, an extract of an official letter from H. Perrine, United States consul for Campeachy, to the Secretary of the Treasury, in relation to this subject, which has been published in the newspapers, and from which I have taken it. Other documents worthy of attention are also herewith sent to the Council. It will be noticed that Mr. Perrine is desirous that an act of the Council should be passed, incorporating himself and his associates into a company for the cultivation of tropical exotics; and he proposes to establish the plantation of the company on the southern part of the peninsula. This enterprise should not be classed with the inflated visionary projects of which Florida has been so prolific; and the failure of which has created so much distrust of all novel undertakings. If those who embark in it should not find it a source of gain, and should, after trial, abandon it, the benefits resulting to the country from the introduction of the many valuable foreign products they will have brought among us must be of considerable importance, and should induce us to render every encouragement and aid in our power to promote the success of the undertaking; and although Mr. Perrine has made no

direct application, I earnestly recommend the granting of a charter as he wishes, and the bestowment upon the company of as many privileges as is compatible with the public interests. The National Legislature, it is to be hoped, will afford aid to so laudable an enterprise, and one which, if successful, promises to be of national benefit, by a grant of land sufficient for their use, or otherwise. I esteem it, however, of paramount consequence that an interest should be excited among the agriculturists throughout the Territory, in relation to the introduction and adoption of foreign products. The tea-plant, those trees and plants from which are procured the olive, ginger, pepper, cloves, cinnamon, pimento, nutmeg, and cocoa, and many other articles of daily use in our families, could, it is believed, with care and attention, be successfully cultivated in most parts of our Territory; but the practicability of every article mentioned being readily produced by those planters favorably located, as it regards climate, cannot be questioned. The production of these articles, if only sufficient for our own domestic consumption, would be of immense advantage to our citizens; and if experience should prove that Florida might, in a few years, be looked to by our fellow-citizens of the States for such products, the benefits resulting to the Territory would be incalculable."

From the Washington Telegraph of January 17.

We publish to-day a highly interesting extract from a letter of Dr. H. Perrine, United States consul at Campeachy, upon the introduction of tropical productions into the Southern States. It is time that the inhabitants of that region should be looking to some new products in the Southern States, to avert the evils of the present oppressive system upon their industry and resources.

Extract of a letter from Dr. H. Perrine.

"I was much interested by the memoir of Doctor Mease on the materials for thread, twine, and cordage, which appeared in the October number of Silliman's Journal. By thus directing the attention of his countrymen towards those foreign plants which produce these materials, he has rendered an acceptable service to the public. The imperfections or errors which exist in that communication are his misfortune, not his fault. The observations of transient travellers on such subjects must necessarily be very limited and very superficial; and the reports of the natives are still less to be trusted. The attention of such men as Humboldt, Bullock, Poinsett, and Warden, was occupied by too many objects to acquire minute intelligence on all; hence the inaccuracies in at least one portion of the compilation made by Doctor Mease. A residence of several years in a tropical climate has enabled me to obtain a personal acquaintance with some of its valuable fibrous plants. Of the highest importance, in my estimation, are those species of the liliaceous tribe which are there prized on account of the quantity or quality of fibres obtained from the interior of their fresh leaves. Many of them, at first ranked under the aloes, were subsequently gratified with the title of agaves; and some of them are merely waiting for the aid of a botanist to become an independent genus.

The *Agave Americana* is still called by travellers the American aloe; and Doctor Mease, with them, has been misled to suppose that this plant produces the Sisal hemp, and the Pita a much finer material: but the *Agave Americana* is dedicated to a very different production—the celebrated drink called '*Pulque*,' derived from the sap of its stem; and hence *Maguey de Pulque* is its common name in Mexico. A direct tax on the consumption of this beverage forms an important item in the revenue of that country. 'The entry duties paid in the three cities of Mexico, Tolusa, and Puebla, amounted, in 1793, to the sum of 817,739 piastres.' Humboldt was correct in affirming of the *Maguey de Pulque*, 'that its cultivation has real advantages over the cultivation of maize, grain, and potatoes; that it is neither affected by drought nor hail, nor the excessive cold which prevails in winter on the higher cordilleras of Mexico; that it grows in the most arid grounds, and frequently on banks of rocks hardly covered with vegetable earth; and that it is one of the most useful of all the productions with which nature has supplied the mountaineers of equinoctial America.' But it is not true that the same plant produces the very fine, very strong, and very long fibres, known by the name of Pita, from which the most beautiful sewing thread is made; nor does it furnish those coarser fibres for twine and cordage, resembling Manila, but denominated Sisal hemp. If tropical *hemp* be an admissible term for the latter, the former may be honored with the distinction of tropical *flax*. The *ixtla*, whose *thin* leaves afford the *pita*, grows wild in the shade of the fertile forests of Tabasco. The *Sosquil* & *Henequin*, whose *thick* leaves yield the Sisal hemp, is cultivated in the sun of the sterile plains of Yucatan: the stem of neither supplies the drink which constitutes the principal value of the *Agave Americana*; nevertheless, a variety of the *Maguey de Pulque* does grow on the tropical shores of the Gulf of Mexico, from which the highland soldiers have occasionally extracted their favorite beverage. Some of the cultivated *Magueys*, brought from a plantation on the mountains to the garden of a gentleman in Campeachy, are there flourishing, notwithstanding the difference in climate, and have produced shoots, which were by me transmitted to New Orleans. Humboldt says that this plant has become wild since the sixteenth century throughout all the south of Europe, the Canary islands, and the coast of Africa; and this fact supports my decided opinion that all the valuable species of the same genus may be successfully cultivated in our Southern States.

"Two varieties of that species, which I take the liberty to christen *Agave Sisalana*, have long been cultivated in the vicinity of Merida, on an extensive scale. Different quantities and qualities of fibres are obtained from several kinds of '*sosquil*,' which grow spontaneously through the whole peninsula of Yucatan; but the planters give the preference to the *Sacqui* and *Yaxqui* of the natives, or the whitish and greenish '*Henequen*.' The young plants are placed about twelve Spanish feet apart, and during the first two years some labor is employed to destroy the weeds between them. In the third year, the cutting of the lower rows of leaves is commenced, and every four months this operation is repeated. Each robust plant will thus give about seventy-five leaves annually, from which are extracted about seven pounds and a half of fibres, and will continue yielding these crops from five to ten years in succession; it is, however, generally cut down as soon as one of the shoots from its roots has grown sufficiently to supply its place: its other offspring are previously removed

to form new plantations. The hardness of the shoots may be inferred from the fact that they are exposed to the sun fifteen or twenty days 'to cicatrize their wounds,' as a necessary preparation for replanting. The simplicity of their cultivation may be conceived from the statement that there is not a hoe, nor a spade, nor a harrow, nor a plough, employed in the agriculture of all Yucatan. The facility of extracting the fibres from their leaves is shown by the rudeness of the instruments which are used by natives for that purpose : a triangular stick of hard wood, with sharp edges, from 24 to 27 inches long, and from one to two inches thick, is with them an equivalent to the shaving-knife of the curriers, by which they scrape away from each side of the leaf, on a board resting against the breast, the cuticle and pulpy substance that covers the fibres. Another mode of accomplishing the same object is, by pressing the sharp semilunar extremity of a long flat stick against any fixed surface upon a narrow longitudinal strip of the leaf, which is then drawn through by the unemployed hand. The length, weight, strength, and other qualities of the fibres, as well as the labor of separating them, vary with the magnitude, age, and position of the leaves ; but, when extracted, a few hours' exposure to the sun completes the preparation of the Sisal hemp for manufactures and commerce.

"The above brief sketch will show that the bales of exported Sisal hemp may contain materials of very different qualities ; and that hence the opinions of its merits expressed by our merchants, our manufacturers, and our scientific men, must vary with the parcels that fall into their hands. The fibres of a single cultivated variety of the *Agave Sisalana* might be assorted like cotton for the foreign market, with denominations and prices corresponding to their relative value ; but the collectors for exportation, unconscious of the true interests of themselves or their country, not merely mingle the whole products of both the *Sacqui* and the *Yaxqui*, but add inferior qualities, obtained from wild varieties of the same, and even of different species ; and injure still further the reputation of this sample abroad, by including the worst proceeds of its imperfect dressings."

Notwithstanding all these disadvantages, the cultivation of Sisal hemp is of the highest importance to the people of Yucatan, *as it is the only article of agriculture* which supplies them with raw materials and domestic manufactures for foreign trade : it has long formed a principal portion of the exports from Sisal to Havana, in the shape of twine, cordage, bagging, &c., for the planters of Cuba. Its ropes and cables have been used in the shipping of various nations ; and entire cargoes of the raw material have been transported to the ports, and wrought in the factories, of Europe and of the United States.

As the *Agave Sisalana* is so important an object of cultivation in the peninsula of Yucatan, how much more important would it be to the peninsula of Florida ?

Ignorance, and indolence, and ineptitude exist on one side of the American Mediterranean ; intelligence, and industry, and ingenuity on the other. Insuperable are the obstacles to enterprise in the nominal republic of the United States of Mexico ; multiplied are the encouragements to improvement in the genuine republic of the United States of America !

A.

PORT OF TABASCO, *in the District of the United States*
Consulate at Campeachy, June 6, 1831.

SIR: As you are the only native American citizen long resident in Tabasco, and well qualified to answer the present note, do me the favor to tell me what sum of money I should have very probably gained since my arrival here, in June, 1827, if I had dedicated myself exclusively to the interested exercise of my profession, instead of generally practising it gratuitously, with the hope of promoting the usefulness of this consulate, and the inquiry after plants suitable for the United States.

I am, sir, very respectfully, your obedient servant,

H. PERRINE.

EZEKIEL P. JOHNSON, *M. D.*

SAN JUAN BAUTISTA, *June 6, 1831.*

SIR: In reply to your note of this morning, I answer, that if, instead of having gratuitously practised your profession in the families of the persons employed under the local and general Governments, and devoting so large a portion of your time to the collection of seeds and plants useful to our country, (and adapted to our soil and climate,) you had applied yourself to the pay practice of your profession during your residence in the Mexican territory, you would, in my opinion, have been now able to return to the United States with ten or twelve thousand dollars as the reward of your industry.

I remain, sir, very respectfully, your obedient servant,

E. P. JOHNSON.

H. PERRINE, *M. D., U. S. Consul.*

NEW YORK, *February 3, 1832.*

I, George Clark, an American citizen, now residing in the city of New York, do hereby certify that, during the years 1829 and 1830, I was engaged in mercantile business in the State of Tabasco, in the district of the United States consulate for Campeachy. That my own personal observations, and the statements of the inhabitants of the country, whether natives or foreigners, corroborate the facts and opinions expressed in the above copy of an original letter from Doctor E. P. Johnson, which I have seen; that the facilities for making money in the consular district of Doctor H. Perrine were abundant, both in professional and mercantile pursuits, which is proved by the fortunes which have been made, since 1827, by his unofficial countrymen; that, within three years of that time, a young merchant gained, by merchandise, upwards of \$50,000, according to his own assertions, which were confirmed by my observations; that a young physician, by his practice alone, gained, in my estimation, at least from three to four thousand dollars a year; that the other physicians and merchants made proportionably enormous gains; that Doctor H. Perrine, from the superiority of his medical reputation, and the privileges of his official situation, enjoyed advantages for practice and merchandise not possessed by any of his countrymen; and that, nevertheless, he sacrificed his splen-

did opportunities for acquiring money through his profession and office, by devoting his medical services gratuitously to the poor and powerful, for the purpose of obtaining useful intelligence concerning the plants of the country, which could not have been purchased in any other way.

GEORGE CLARK.

No. 2.

Whereas the present Legislative Council, with a view of encouraging the cultivation of useful foreign and tropical plants, have passed a law incorporating the "Tropical Plant Company of Florida:" and whereas it is believed that a grant of land by Congress, somewhere in the southern part of the peninsula of Florida would be greatly conducive to the public good, and promote the views of said company, and might be made without detriment to the public interest:

Be it, therefore, resolved, That our delegate in Congress be, and he is hereby, requested to use his endeavors to procure the passage of a law making such grant to the said company, for the objects aforesaid, as may best comport with the public good.

Resolved, further, That a copy of this preamble and resolution be immediately forwarded to him.

A true copy:

Test :

JOHN K. CAMPBELL. *Clerk.*

No. 3.

LYCEUM OF NATURAL HISTORY,

New York, February 10, 1832.

DEAR SIR: The subject of your paper on the Agave Sisalana, read before the Lyceum on January 9, 1832, has been duly examined by their committee, who gave in their report at the last sitting of the society; which report, by order of the same, I now transmit.

Extract from the minutes.

"Feb. 9, 1832.—Mr. Halsey, of the committee to whom were referred the papers read before the Lyceum on January 9th, by Dr. Perrine American consul at Campeachy in Yucatan, on the subject of Sisal hemp (Agave Sisalana) and other tropical plants, gave in their report, accompanied with the following resolutions, which were *unanimously* accepted.

"At the sitting of the Lyceum, January 9, 1832, Dr. Perrine, American consul at Campeachy in Yucatan, read some observations on the culture, &c., of the Sisal hemp, and other tropical plants, from which materials are furnished of extensive use in commerce and in the arts.

"*Resolved,* That the Lyceum concur in the views of the subject given by Dr. Perrinne; and conceiving the great national benefit which might be derived from the introduction and general culture of those plants in such sections of the Union as would be suitable to their growth, they

consider the proposition of Dr. Perrine as particularly meriting the patronage of Government, and unite with him in recommending that a grant of land be made by Congress for the purpose of conducting his experiments on the same.

"On motion, it was unanimously

"*Resolved*, That the recording secretary be instructed to transmit to Dr. Perrine a copy of the report and accompanying resolutions on the subject of his paper."

Respectfully yours,

L. D. GALE,

Recording Secretary of the Lyceum.

TO DR. PERRINE,

American Consul at Campeachy in Yucatan.

No. 4.

NEW YORK, *February 21, 1831.*

SIR: Should the memorial of my friend Dr. Perrine, United States consul for Campeachy, relative to the domestication of tropical plants, come before your committee, you will perceive that I have borne my humble testimony to his services and sacrifices in the important enterprise therein set forth.

My residence for several years in a tropical climate, by giving me a knowledge of its productions, has enabled me to appreciate so highly Dr. Perrine's plans, that I have consented, if it should be thought proper, to have my name asserted in the act of the Legislative Council of Florida, as one of the trustees of the Tropical Plant Company.

A full, fair, and friendly investigation of his memorial and accompanying documents will, I hope, satisfy you that a grant to him of the land for which he petitions will result in important benefits to the southern portion of our country. If so, permit me to request you to lend your aid to bring the application to a favorable issue. Without the grant of land, he will be unable to continue any measures for the speedy and complete success of this truly national enterprise, which has hitherto been kept up by his individual and unaided exertions.

As I possess no interest in the result of his application to Congress, I feel the greater confidence in addressing you in behalf of the memorial; and I am convinced that no association will execute his liberal views for the public good, unless legislative aid be extended to forward the enterprise.

I am, very respectfully, your most obedient servant,

E. P. JOHNSTON.

Hon. ERASTUS ROOT.

No. 5.

PENSACOLA, *December 29, 1831.*

DEAR SIR: The establishment of every new branch of industry, whether it be by the introduction of a new manufacture or of a new article of

culture, I consider a positive and permanent addition to national wealth. For this reason, I viewed the letter of our consul at Campeachy, which you had the goodness to enclose to me, on the subject of the Campeachy or Sisal hemp, as being well worthy of attention. The use of what is commonly called the *grass rope* has been extending itself in the United States in a surprising manner of late years. Nearly all our steamboats on the Western waters use no other, and it is getting rapidly into use for hawsers, pulley-ropes, rugs, and even for the running rigging of our merchant ships; indeed, it is impossible at present to say to what extent its uses may be carried. It is lighter, stronger, and more durable than common hemp, and may be applied to many purposes to better advantage than that article. I do not know what quantity is imported in the manufactured or unmanufactured state; but this is certainly a subject well worthy of the attention of the patriotic statesman, as I have ascertained, in the most satisfactory manner, that *the plant is a native of Florida, and of the Southern States in the same latitude.*

From the exact similarity of the ropes made by the Florida Indians, I was satisfied that it was made from the same plant which was pointed out by Spanish gentlemen here as the *pita* cultivated in Campeachy. I have lately seen a person from that country, to whom I exhibited the plant; and he positively assures me that it is the same. It is of the palm family, resembles the bouquet palmetto; the leaves are softer and more pliant, but it has a sharp point or needle like it. My friend and fellow-traveller, Mr. Nuttall, can give you its botanical name and character.* The plant requires considerable space—say at least five feet square; is placed in hills or squares, like Indian corn, and will occupy the whole by its leaves and side shoots. I should think about a thousand plants might be placed on an acre, producing at least a pound of hemp to each; and if the culture should be successful, it must afford immense profits to those who will first engage in it, as it will require few hands. The plant being perennial, the plantation, once made, will last for years.

The *pita* grows in great abundance, even in the poor sandy pine lands; but, on the thin oak and hickory ridges, where the soil, although sandy, is more fertile, it grows in perfection. The new settlers now begin to use it for domestic purposes; they rot it, by throwing it into a pond or stream of water for a month, when the fibre is separated from the bark with great ease. As it is easily transplanted, I have no doubt a sufficient quantity can be obtained at once, in its wild state, to make a respectable field, almost anywhere, in the space of a mile or two. I know, from actual experiment, that it can be transplanted without difficulty; that it will bear to be cut once a year; and will, in that period, again attain the former size, or even greater.

Would it not be well to make some more minute inquiries of our consul as to the mode of cultivating this valuable plant? It certainly deserves to be encouraged by our Government; at least, the necessary information might be procured for the benefit of those enterprising individuals who may be disposed to engage in it.

With sentiments of respect, I am your most obedient servant,
H. M. BRACKENRIDGE.

Hon. J. M. WHITE.

* *Yucca gloriosa.*

No. 6.

PLANTS OF MEXICO.

Extract of a letter from Henry Perrine, Esq., United States consul for Campeachy, to the Secretary of the Treasury, dated

NEW YORK, November 8, 1831.

"SIR: The Treasury circular of the 6th of September, 1827, relative to the introduction of useful exotics into the United States, addressed to a portion of the American consuls, directed the inquiries of the subscriber (United States consul for Campeachy) particularly to the log-wood tree, which abounds in the peninsula of Yucatan. His first communication to the Department, dated 1st January, 1829, contained a brief sketch of the information then obtained, and endeavored to attract its attention towards the *fibrous* plants of that region, as subjects of much greater and more immediate utility. Belonging to the natural family Liliacea, the species of the genus *Agave* appeared to him of transcendent importance. In his communication of January 1, 1830, he again expressed that opinion, which has been confirmed by his subsequent observations in Tabasco, and sustained by all the intelligence acquired since his arrival in this city, on the 13th August last. The utility of these plants has been noticed in almost every work on Mexico, from the conquest to the present day. According to Clavigero, the name of Mexico, "quiere decir en el centro del Maguey, ó Pita, ó Aloe Americano." (*Agave Americana* of Humboldt.) A reference to the same author shows the manifold utility of these plants to the ancient Mexicans. Some species furnish themselves protecting enclosures, and afford impassable hedges to other objects of cultivation. From the juice of others are extracted honey, sugar, vinegar, *pulque*, and ardent spirits. The *Pulque de Maguey* is the celebrated substitute for beer, cider, and wine—preferred, even by foreigners, to every other liquor. From the trunk and thickest portion of the leaves, roasted in the earth, an agreeable food is obtained. The sap is applied externally to indolent sores and tumors, and a preparation is used internally for urinary and other diseases. The stalks serve for the beams, and the leaves for the roofs of huts. The thorns answer for lancets, awls, needles, arrow-heads, and other cutting and penetrating instruments. The fibrous substance of the leaves is, however, the most important gift of the *Agave* genus to Mexico. According to the species, the fibre varies in quality from the coarsest hemp to the finest flax, and may be employed as a superior substitute for both. From it the Mexicans fabricated their thread and cordage, mats and bagging, shoes and clothing, and webs, equivalent to cambric and canvass; the hammocks in which they are born, repose, and die; and the paper on which they painted their histories, and with which they adorned and adored their gods. The value of all the agaves is enhanced by their indifference to soil, climate, and season; by the simplicity of their cultivation; and by the facility of extracting and preparing their products. It is not, therefore, surprising that the ancient Mexicans used some part or preparation of these plants in their civil, military, and religious ceremonies, at marriages and deaths; nor that they perpetuated an allusion to their properties in the name of their capital.

"Humboldt, Poinsett, Warden, and other foreigners, seem to consider the *fine fibres*, called *pita*, a product of the same plant that produces the *pulque*. But the *maguey* from which the drink is obtained, is a totally different species, and furnishes fibres of the coarsest texture. The *pita*

plant, like the cacao, grows best in the shade, and its leaves are long, narrow, and slender; the fibres of one of which accompany this communication. From this species is probably fabricated, in China, that beautiful glossy, fine, and strong stuff, known here by the name of grass-cloth. The Sisal hemp of commerce is obtained from two varieties of another species of the agave, which have long been cultivated in the vicinity of Merida. To this species the subscriber refers the Manilla hemp, although he has not hitherto been able to obtain any satisfactory account of the plant which produces it, from our scientific and mercantile men, nor from books. Captain John White, of the navy yard at Charlestown, states his impression that it is obtained from the bark of a species of palm tree, but its texture does not warrant that opinion; and Captain Morril, recently from Manilla, confirms the inference above expressed by the subscriber.

“ Doctor Hernandez describes nineteen species of agave as indigenous to Mexico, which vary more in the character of their interior substance than in the form and color of their leaves; and, among these, the precise variety which produces the Manilla hemp will probably be found. Some species are prized for the beauty of their flowers, and some for the odor and others for the flavor of their fruit; but the subscriber limits his recommendation to Government of those which are most valuable on account of the quantity and quality of their fibres. Their cultivation in the United States, he still believes, will form an era in our agricultural and manufacturing prosperity, as distinguished as the invention of the cotton-gin. He has shown, in his former communications, the almost insuperable obstacles to his introducing these plants, unaided and alone; but he had, nevertheless, the satisfaction to be apprized by Mr. Gordon, the collector of New Orleans, that the young Sisal-hemp varieties, sent by him to that city, had arrived in a thriving and vigorous condition. The subscriber believes that an act of the Legislative Council of Florida, incorporating himself and associates into a company for the cultivation of tropical exotics, will be necessary to accomplish the views of Government, as manifested in the Treasury circular of the 6th of September, 1827.

“ He believes that he has information in his possession sufficient to attract capital to the enterprise. Once formed, the company might, in the same vessel, bring other useful exotics, although their pecuniary interests would confine them to the fibrous plants. Acclimated in the southern extremity of East Florida, they would gradually extend up to the adjoining States on the Gulf of Mexico and the Atlantic ocean. The seed of the logwood would probably be coveted for hedges, on account of its beauty, novelty, and utility. The arnatto would be propagated, were it merely as an ornamental tree. The India rubber would be sought at least as a curiosity, and so would the pimento.

“ Ginger and turmeric present the stimulus of immediate profit. The Nankin and the tree cotton would find a genial climate. The tropical shrubs, whose leaves are a substitute for indigo, and the tree whose fruit serves for soap, would likewise there find a home. The ‘ramon’ would accompany them, to furnish, with its leaves and tender branches, the food for domestic animals in the driest seasons, and, with its fruit, a subsistence for the human family in times of scarcity of corn. In short, every useful tropical plant would likely be introduced by an incorporated company for cultivating the fibrous species at the southern extremity of East Florida.”

The above, with some corrections, is from the Globe of the 19th instant.

We are personally acquainted with our enterprising fellow-Jerseyman, Dr. Perrine, and we heartily wish that he may be ultimately recompensed for the time, labor, and money, which he has sacrificed, and is still devoting to the introduction of useful plants into the United States. We understand that he believes the Cochineal plant and insect may be successfully reared in East Florida, inasmuch as the experiment has succeeded in Spain; and that he is possessed of all the details relative to the management of both. The stingless bees of Yucatan, introduced by him, (of which he has deposited a hive in Peale's museum at New York,) will be an invaluable acquisition to our Southern and Southwestern States, and may be gradually propagated throughout the Union. It is to be lamented that Government does not possess the power to appropriate funds to aid its agents in the duties of this class, imposed upon them by the Treasury circular. It is still more lamentable that our consulates, especially in Spanish America, are not salaried, and filled with scientific men, whose pursuits would be useful to their country; and that they are too generally obtained as a mere speculation, to aid the mercantile business of the possessor, to the injury of his countrymen in the same trade, and to the degradation of his office in the eyes of foreigners.—*New Brunswick Times*.

No. 7.

THE AGAVE SISALANA, OR SISAL HEMP.

In our paper of the 4th January we called the attention of readers to an extract of a letter on the plants of Mexico, from Dr. H. Perrine, the American consul for Campeachy, to the Secretary of the Treasury, which was published in the Washington Globe of the 19th November last. We now particularly invite their attention to another extract of a letter on a single cultivated plant of Yucatan, from the same gentleman to Dr. Howell, of Princeton, New Jersey, which was published in the Telegraph of the 17th ultimo, and which will be found in the first page of this paper. The importance attached by the Lyceum of Natural History of New York to the subject of this article, is manifested by that society in a unanimous resolution recommending it to national patronage. By the Tallahassee Floridian of the 3d ultimo, we perceive that the Governor of that Territory, in his message to the Legislative Council, warmly applauds the important enterprise suggested in the letter of Dr. Perrine to the Treasury Department, of domesticating tropical plants in the southern extremity of Florida, by means of an incorporated company; and hopes that the National Government will aid him by a grant of land, or otherwise, to accomplish this laudable object of his ambition. In the same paper, of the 17th ultimo, we observe the passage of an act with the title of the "Tropical Plant Company of Florida," which is said to be composed of the most distinguished residents of that peninsula. And we hope to see an announcement in the Washington papers that the General Government has given its testimony to the importance of this great enterprise, and of the services of Dr. Perrine, by an act of Congress granting him an ample tract of land in the unsettled tropical extremity of East Florida, to encourage the introduction and promote the culture of tropical plants. Such a tract of land

thus granted, although in quantity not a pecuniary equivalent to his sacrifices, in obeying the Treasury circular of September 6, 1827, would have a recommendatory value to attract capital and associates disposed to subserve his most liberal views for the public good, and his own consequent reputation, even at the expense of their own *immediate* interests. Of the ultimate gain, both to individuals and the country at large, we have no doubt; *but we do entertain a great doubt whether this national enterprise will be effectually pursued for many years to come, without the directing influence of the individual zeal, energy, perseverance, and patriotic ambition of Dr. Perrine. Our first acquaintance with the doctor commenced in the island of Cuba, to which he was driven by sickness, and we by business, in the spring of 1826. He was then expatiating on the advantages to be derived from the introduction of tropical plants to the industry of our free institutions, and the facility with which it could be accomplished, in consequence of the proximity of Florida.*

From a resolution of Congress the ensuing year, the introduction of exotics in general was undertaken by the Government of the United States, by means of the Treasury circular addressed to a portion of the American consuls, of whom, as far as we can learn, Dr. Perrine is the only one who has taken any effectual measures to promote its objects, by acquiring useful intelligence concerning the various valuable plants abounding in his consular district, which, until very recently, included, with the peninsula of Yucatan, the State of Tabasco. Although the circular intimated the possibility of an appropriation of funds by Congress, none has hitherto been made: and in this state this national enterprise at present remains, virtually and apparently entirely abandoned by the National Government. The most important department of it, however, viz: the domestication of tropical plants, we hope to see accomplished by the persevering public spirit of Dr. Perrine. It is useless to specify the many useful trees and plants which will be thus introduced for food, drink, and medicine; for cheap clothing; for sumptuous furniture; for domestic utensils; for the ornament of our dwellings; for the durability of our shipping; for extensive consumption in our manufactures and the arts; in short, for many of the necessaries and comforts and luxuries of civilized life. It is sufficient to contemplate the advantages which will accrue to the nation in general from the introduction of the single species of tropical plants which produces the Sisal hemp, to show that it merits the special patronage of Government.

The Doctor has very judiciously concluded his account of the cultivation of the *Agave Sisalana*, in the peninsula of Yucatan, without entering into details of the great benefits which would be derived from its cultivation in the peninsula of Florida, as they are evident to every reflecting mind. Although its culture requires a considerable superficies of soil, it needs but a trifling amount of labor; which exactly adapts it to the agriculture of our country, where land is cheap and labor is dear. The quantity or cost of the soil is a very inconsiderable item in the calculation of an American planter. The capital necessary to be added to it, or employed upon it, constitutes his only embarrassment: and the great desideratum, therefore, is a staple for cultivation, which, with the least total amount of money, will produce the greatest proportional gain. The *Agave Sisalana* supplies this great object sought. What object of cultivation in the United States—nay, in the world—unites in so great a degree these peculiar advan-

tages? We shall have the tea-plant, the olive, and the vine; but we trust that many, many years will elapse before we are obliged to compete with the French, and the Italians, and the Chinese, in making their culture a means of subsistence for a crowded and necessitous population. From the planting of the Sisal hemp to the cutting of its leaves, how trifling is the amount of labor bestowed! how equable its division through the year! how abundant the reproduction! how long the duration! Indeed, it scarcely needs more care and cost than the trees of our forests. The principal capital and labor devoted to it (which we may estimate at three-fourths of the whole) commence only with the extraction of the fibres from the fresh leaves, to furnish the raw material for the manufacturing market; and this preparation may be called the semi-manufacture of the planter, which begins where pure cultivation ends. The cut leaves are in the same relative condition to the planter as the plucked cotton. The labor of separating the seeds, before the invention of Whitney's gin, rendered it a comparatively worthless object of cultivation. Can we believe that the Agave Sisalana will be long a citizen of the United States, without the invention of a corresponding machine to extract its fibres? If the Sisal hemp be a profitable article to the inhabitants of Yucatan at one hundred dollars the ton, without any labor-saving machinery; how much more profitable will it be to the inhabitants of Florida at two hundred dollars, when aided by American intelligence, industry, and ingenuity?

No. 8.

Circular to a portion of the Consuls of the United States.

TREASURY DEPARTMENT, September 6, 1827.

SIR: The President is desirous of causing to be introduced into the United States all such trees and plants from other countries, not heretofore known in the United States, as may give promise, under proper cultivation, of flourishing and becoming useful, as well as superior varieties of such as are already cultivated here. To this end, I have his directions to address myself to you, invoking your aid to give effect to the plan that he has in view. Forest trees useful for timber; grain of any description; fruit trees; vegetables for the table; esculent roots; and, in short, plants of whatever nature, whether useful as food for man or the domestic animals, or for purposes connected with manufactures or any of the useful arts, fall within the scope of the plan proposed. A specification of some of them to be had in the country where you reside, and believed to fall under one or other of the above heads, is given at the foot of this letter, as samples merely; it not being intended to exclude others of which you may yourself have knowledge, or be able, on inquiry, to obtain knowledge. With any that you may have it in your power to send, it will be desirable to send such notices of their cultivation and natural history as may be attainable in the country to which they are indigenous; and the following questions are amongst those that will indicate the particulars concerning which information may be sought:

1. The latitude and soil in which the plant most flourishes?
2. What are the seasons of its bloom and maturity, and what the term of its duration?

3. In what manner it is propagated—by roots, seeds, buds, grafts, layers, or how? and how cultivated? and are there any unusual circumstances attending its cultivation?

4. Is it affected by frost in countries where frost prevails?

5. The native or popular name of the plant, and (where known) its botanical name and character?

6. The elevation of the place of its growth above the level of the sea?

7. Is there, in the agricultural literature of the country, any special treatise or dissertation upon its culture? If so, let it be stated.

8. Is there any insect particularly habituated to it?

9. Lastly—its use, whether for food, medicine, or the arts?

In removing seeds or plants from remote places across the ocean, or otherwise, great care is often necessary to be observed in the manner of putting them up and conveying them. To aid your efforts in this respect, upon the present occasion, a paper of directions has been prepared, and is herewith transmitted.

The President will hope for your attention to the objects of this communication, as far as circumstances will allow; and it is not doubted but that your own public feelings will impart to your endeavors under it a zeal proportioned to the beneficial results to which the communication looks. It is proper to add that no expense can, at present, be authorized in relation to it. It is possible, however, that Congress may not be indisposed to provide a small fund for it. The seeds, plants, cuttings, or whatever other germinating substance you may transmit, must be addressed to the Treasury Department, and sent to the collector of the port to which the vessel conveying them is destined, or where she may arrive, accompanied by a letter of advice to the Department. The Secretary of the Navy has instructed the commanders of such of the public vessels of the United States as may ever touch at your port to lend you their assistance towards giving effect to the objects of this communication, as you will perceive by the copy of his letter of instructions, which is herewith enclosed for your information. It is believed, also, that the masters of the merchant vessels of the United States will generally be willing—such is their well-known public spirit—to lend their gratuitous co-operation towards effecting the objects proposed.

I remain, respectfully, your most obedient servant,

RICHARD RUSH.

Directions for putting up and transmitting seeds and plants; accompanying the letter of the Secretary of the Treasury of September 6, 1827.

With a view to the transmission of seeds from distant countries, the first object of care is to obtain seeds that are fully ripe, and in a sound and healthy state. To this, the strictest attention should be paid; otherwise, all the care and trouble that may be bestowed on them will have been wasted on objects utterly useless.

Those seeds that are not dry when gathered, should be rendered so by exposure to the air, in the shade.

When dry, the seeds should be put into paper bags. Common brown

paper has been found to answer well for making such bags. But, as the mode of manufacturing that paper varies in different countries, the precaution should be used of putting a portion of the seeds in other kinds of paper. Those that most effectually exclude air and moisture are believed to be the best for that purpose. It would be proper, also, to enclose some of the seeds in paper or cloth that has been steeped in melted bees-wax. It has been recommended that seeds collected in a moist country or season be packed in charcoal.

After being put up according to any of these modes, the seeds should be enclosed in a box, which should be covered with pitch, to prevent them from damp, insects, and mice. During the voyage they should be kept in a cool, airy, and dry situation—not in the hold of the ship.

The oily seeds soonest lose their germinating faculty. They should be put in a box with sandy earth, in the following manner: First, about two inches of earth at the bottom; into this the seeds should be placed at distances proportionate to their size; on these another layer of earth about an inch thick, and then another layer of seeds; and so on, with alternate layers of earth and seeds, until the box is filled within about a foot of the top, which space should be filled with sand; taking care that the earth and sand be well put in, that the seeds may not get out of place. The box should then be covered with a close net-work of cord well pitched, or with split hoops or laths well pitched, so as to admit the air without exposing the contents of the box to be disturbed by mice or accident. The seeds thus put up will germinate during their passage, and will be in a state to be planted immediately on their arrival.

Although some seeds with a hard shell, such as nuts, peaches, plums, &c., do not come up until a long time after they are sown, it would be proper, when the kernel is oily, to follow the method just pointed out, that they may not turn rancid on the passage. This precaution is also useful for the family of laurels (*laurineæ*) and that of myrtles, (*myrti*), especially when they have to cross the equatorial seas.

To guard against the casualties to which seeds in a germinating state may be exposed during a long voyage, and as another means of ensuring the success of seeds of the kinds here recommended to be put into boxes with earth, it would be well also to enclose some of them (each seed separately) in a coat of bees-wax, and afterwards pack them in a box covered with pitch.

In many cases it will be necessary to transmit roots. Where roots are to be transmitted, fibrous roots should be dealt with in the manner herein recommended for young plants. Bulbous and tuberous roots should be put into boxes, in the same manner as has already been recommended for oleaginous seeds; except that, instead of earth, dry sand, as free as possible from earthy particles, should be used. Some of the bulbous and tuberous roots, instead of being packed in sand, may be wrapped in paper, and put in boxes covered with net-work or laths. Roots should not be put in the same box with seeds.

Where the seeds of plants cannot be successfully transmitted, they may be sown in boxes, and sent in a vegetating state. Where more than one kind is sown in the same box, they should be kept distinct by laths, fastened in it crosswise on a level with the surface of the ground in which they are sown; and when different soils are required, it will be necessary to make separate compartments in the box. In either case, they should be

properly marked, and referred to in the descriptive notes which accompany them.

When plants cannot be propagated from seeds, with a certainty of their possessing the same qualities which long culture or other causes may have given them, they may be sent in a growing state. For this purpose, they should be taken up when young. Those, however, who are acquainted with their cultivation in the countries where they grow, will know at what age they may be safely and advantageously removed. They may be transplanted direct into the boxes in which they are to be conveyed; or, where that cannot be conveniently done, they may be taken up with a ball of earth about the roots, and the roots of each surrounded with wet moss, carefully tied about it, to keep the earth moist. They may afterwards be put into a box, and each plant secured by laths fastened cross-wise above the roots, and the interstices between the roots filled with wet moss. The same methods may be observed with young grafted or budded fruit trees.

Where the time will permit, it is desirable that the roots of the plants be well established in the boxes in which they are transplanted. Herbaceous plants require only a short time for this; but, for plants of a woody texture, two or three months is sometimes necessary.

Boxes, for the conveyance of plants, or of seeds that are sown, may be made about two feet broad, two feet deep, and four feet long, with small holes in the bottom, covered with a shell or piece of tile, or other similar substance, for letting off any superfluous water. There should be a layer of wet moss of two or three inches deep at the bottom; or, if that cannot be had, some very rotten wood or decayed leaves; and upon that about twelve inches depth of fresh loamy earth, into which the plants that are to be transplanted should be set. The surface of the earth should be covered with a thin layer of moss, cut small, which should be occasionally washed in fresh water during the voyage, both to keep the surface moist, and to wash off mouldiness, or any saline particles that may be on it.

When the boxes are about to be put on board the ship, hoops of wood should be fastened to the sides in such a manner that, arching over the box, they may cover the highest of the plants; and over these should be stretched a net-work of pitched cord, so as to protect the plants from external injury, and prevent the earth from being disturbed by mice or other vermin.

To each box should be fastened a canvass cover, made to go entirely over it, but so constructed as to be easily put on or off, as may be necessary to protect the plants from the salt water, or winds, and sometimes from the sunshine. Strong handles should be fixed to the boxes, that they may be conveniently moved.

During the voyage the plants should be kept in a light, airy situation; without which, they will perish. They should not be exposed to severe winds, nor to cold, nor, for a long time, to too hot a sunshine, nor to the spray of the salt water. To prevent injury from the saline particles with which the air is oftentimes charged at sea, (especially when the waves have white frothy curls upon them,) and which, on evaporation, close up the pores of the plants and destroy them, it will be proper, when they have been exposed to them, to wash off the salt particles by sprinkling the leaves with fresh water.

The plants and seeds that are sown will occasionally require watering

on the voyage, for which purpose rain water is best. If, in any special case, particular instructions on this point, or upon any other connected with the management of the plants during the voyage, be necessary, they should be made known to those having charge of the plants. But, after all, much will depend upon the judicious care of those to whom the plants may be confided during the voyage.

Plants of the succulent kind, and particularly of the cactus family, should not be planted in earth, but in mixture of dry sand, old lime rubbish, and vegetable mould, in about equal parts, and should not be watered.

It may not be necessary, in every case, to observe all the precautions here recommended in regard to the putting up and transmission of seeds; but it is believed that there will be the risk in departing from them, in proportion to the distance of the country from which the seeds are to be brought, and to the difference of its latitude, or of the latitudes through which they will pass on the voyage. It is not intended, however, by these instructions, to exclude the adoption of any other modes of putting up and transmitting seeds and plants which are in use in any particular place, and which have been found successful, especially if more simple. And it is recommended that not only the aid of competent persons be accepted in procuring and putting up the seeds and plants, but that they be invited to offer any suggestions in regard to the treatment of the plants during the voyage, and their cultivation and use afterwards.

CIRCULAR.

NAVY DEPARTMENT.

SIR: I have to call your attention to the enclosed copy of a communication from the Treasury Department to the consuls of the United States at various posts; and to desire that the objects of that communication may be promoted by you, on all occasions, as far as may be in your power.

The Executive takes a deep interest in this matter; and, by particular attention to it, you will probably confer a lasting benefit to the country.

The letter of the Secretary of the Treasury is so full and satisfactory, that no farther explanations seem necessary on my part.

You will be pleased to report to the Department what you do in execution of this object, and return the papers to the Department when you are detached from the vessel which you now command.

I am, respectfully, &c.

SAM. L. SOUTHARD.

No. 9.

ARTICLE 7.

Calculation of the representative capital of the agriculture and rural industry of Cuba, their product, and nett income.

The data, and their results, of the preceding articles, will now serve to form a calculation, by way of first attempt, of the agricultural capital represented in the various country properties of the island, commencing by taking up some of the elements necessary for this purpose, and which, will be explained in the course of this chapter.

Of the 468,523 caballerias of land which compose the whole territory, 38,276 are in a state of cultivation, and 9,734 in grazing ground and in unfelled woods, belonging to sugar and coffee estates. Of the first, or that part employed in plantations, which serve for nourishing the people, or for exportation, the following estimate may be made :

In sugar cane	-	-	-	-	5,394
coffee trees	-	-	-	-	5,761
tobacco	-	-	-	-	1,389
lesser or general cultivation	-	-	-	-	20,732
the same on large estates	-	-	-	-	5,000

Total, 38,276 caballerias.

It appears that there is an area of 430,247 caballerias uncultivated in the whole island : some employed in raising and fattening animals, others in settlements or towns, in mountains, roads, coasts, rivers, and lakes ; but the greater part absolute deserts.

The value of lands in private property has been valued already, in the following manner :

Original.

32,857 caballerias in grazing grounds, for larger and for smaller cattle, halos and corrales, at \$100	\$3,285,700
10,952 do in grazing grounds attached to estates, with enclosures, at \$1,000	10,952,000
15,300 do in sugar estates, at \$1,500	22,950,000
9,200 do in coffee do do	13,800,000
20,732 do in smaller cultivation, provisions, &c. at \$2,000	41,464,000
2,778 do in tobacco, at \$700	1,944,600

Total value of lands - \$94,396,300
not including those in cocoa or cotton, which are supposed to be annexed to those above mentioned.

The buildings, engines, materials of labor, and other utensils of country estates, are mentioned in value, as follows :

In the primitive pastures	-	-	-	-	\$1,737,000
pasture or grazing grounds of estates	-	-	-	-	619,600
sugar estates	-	-	-	-	29,835,000
coffee do	-	-	-	-	20,000,000
smaller cultivation	-	-	-	-	2,789,400
tobacco	-	-	-	-	622,850

Total value of buildings, utensils, &c. - \$55,603,850

The value of the different objects of cultivation are thus valued respectively :

Sugar cane in the ground	-	-	-	-	\$6,068,877
Coffee trees	-	-	-	-	32,500,000
Fruit trees, vegetables, &c., of smaller estates	-	-	-	-	41,464,000
The same on the larger estates	-	-	-	-	5,476,700
Tobacco plants	-	-	-	-	340,620

Total value of plants - \$85,850,197

When the object is to know, by approximation, the value of the rural productions, whether spontaneous or from labor, the calculation should include the value of the woods. To do so, we have made use of certain facts, but also of the following suppositions :

The value of the wood exported in 1829, was	-	-	\$155,563
Suppose only ten times greater the quantity consumed on the island	-	-	1,555,630
The charcoal consumed has been valued already at	-	-	2,107,300

Total value of the produce of the woods	-	<u>\$3,818,493</u>
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But as this may belong to the department of commerce, we shall suppose that the agricultural value be only one-tenth, or \$381,849. On the other hand, the annual cuttings of timber and firewood, for consumption of the interior, and for exportation, cannot be graduated at more than 1-500th part of that standing in woods, when the vast extent of this is considered ; and connecting this circumstance with the foregoing, the minimum value of the woods of the island of Cuba will be equal to that of the agricultural annual income multiplied by 500, or \$190,924,500.

Now, in continuance of the foregoing general calculation, the representative value of the slaves and animals must be estimated, which render productive the capital invested in lands, engines, utensils, and plantations. The value of these I have calculated in the preceding articles, in the manner following :

100,000 slaves in sugar and coffee estates, at \$300	-	\$30,000,000
31,065 do in smaller cultivation	-	9,319,500
7,927 do in tobacco	-	2,378,100

Total value of 138,992 slaves, supposed useful, at \$300	<u>\$41,797,600</u>
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The others being supposed of little or no value.

1,058,732 beeves and 893,538 hogs existing in the original grazing grounds	-	\$21,282,077
140,539 oxen for labor and hauling	-	7,026,950
186,973 horses, supposing 20,000 employed in other private uses, separate from estates	-	9,348,650
9,642 mules and asses, deducting 10,000, which may be found in other occupations	-	771,360
46,962 sheep, goats, &c.	-	187,848
1,000,000 domestic breeding birds	-	1,000,000

Total value of animals	-	<u>\$39,616,885</u>
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Recapitulation.

Lands	-	\$94,396,300
Plants, including the woods	-	276,774,697
Buildings, engines, and utensils	-	55,603,850
Slaves	-	41,797,600
Animals	-	39,616,885

Representative value of the agriculture	-	\$508,189,332
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Representative value of the capital invested	<u>\$317,264,832</u>
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Calculation of the gross products of agriculture and rural industry.

These consist either in vegetable productions in their simple state, or in products of rural industry as extracted upon various properties from the same vegetables, or in profits from animals of the estates in general. As all these have been enumerated in the preceding articles, in each branch respectively, we will now only present the recapitulation.

Vegetable productions.

8,091,837	arrobas of sugar, white and brown	-	-	\$8,091,837
81,545	do of inferior do	-	-	40,772
35,103	hogsheads of molasses	-	-	202,932
2,883,528	arrobas of coffee	-	-	4,325,292
23,806	do of cocoa	-	-	74,390
38,142	do of cotton	-	-	125,000
500,000	do of tobacco in the leaf	-	-	681,240
520,897	do of rice	-	-	454,230
165,659	do of beans, peas, garlic, onions, &c.	-	-	237,256
1,617,806	fanegas (nearly a barrel) of maize	-	-	4,853,418
4,051,245	horsesloads of vegetables and fruits	-	-	11,475,712
2,793,308	do of grapes	-	-	5,586,616
36,535	do of casada	-	-	146,144
2,107,300	bags of charcoal	-	-	2,107,300
	Woods, or products of the woods	-	-	1,711,193
Total value of vegetable productions				<u>\$40,639,871</u>

Animal productions.

180,289	beeves	-	-	\$3,605,780
	Equal number of hides	-	-	180,289
269,211	hogs	-	-	1,346,055
60,000	calves and colts, of all kinds	-	-	1,200,000
30,000	animals giving wool	-	-	120,000
1,953,120	domestic birds	-	-	976,560
29,952	thousands of eggs	-	-	1,060,800
592,800	jars of milk	-	-	296,400
63,160	arrobas of virgin wax, at \$3	-	-	189,480
76,404	do of honey, at 5 rials	-	-	47,752
Total value of animal productions				<u>\$9,023,116</u>
Vegetable productions				40,639,871
Animal productions				9,023,116
Total gross produce of agriculture				<u>\$49,662,987</u>

Calculation of the nett rent of agricultural and rural industry.

Nett produce of the primitive grazing grounds	-	-	\$2,928,405
the grazing grounds of estates	-	-	2,169,161
sugar estates	-	-	4,189,043
coffee estates	-	-	1,287,375
smaller cultivation	-	-	11,861,984
tobacco	-	-	372,654
Total of nett product	-	-	<u>\$22,808,622</u>

General recapitulation.

Representative value of the agriculture of Cuba	-	\$508,189,332
of capital invested	-	317,264,832
of gross products	-	49,662,987
of nett rent	-	22,808,622

From these results there are many deductions to be made:

1. That the nett rent answers to 7 per cent. of the representative capital of estates, and that it is almost equal to the half of the gross produce.

2. That, comparatively with the extent of the ground under cultivation, (this being, according to former statistics, 91,819 caballerias,) there is to each caballeria a value of 546 dollars, yearly, of gross product, and 248 dollars of nett rent.

3. That, in respect to population, each free person appears to have a value, in gross product, of 120 dollars; and of the nett, 53 dollars.

4. Supposing a maximum of as many agricultural families as there are estates on the island; the number of these being 33,112, there appears to each family a property of 9,581 dollars, produce to the amount of 1,514 dollars, and a nett rent of 680 dollars.

5. Upon examining particularly the products of each kind of cultivation, the small estates appear to be much more considerable—that is, the vegetable and fruit plantations. The demonstration is this:

1. Grazing grounds of all kinds cost	\$24,139,417,	produce	\$5,051,835
2. Sugar estates,	-	83,780,877	- 8,862,087
3. Coffee estates,	-	85,825,000	- 4,325,292
4. Vegetable and fruit plantations	- 111,861,984	-	24,867,638

The lesser properties, as is seen, produce six times as much as the coffee estates; five times that of grazing grounds; and three times that of sugar estates; and of themselves alone, one-third more than the others united: although the capital invested in these is less by two-fifths than that of the grazing grounds, and sugar and coffee estates.

NOTE.—This proves that Cuba is more indebted for her prosperity and her *safety* to her small cultivators of fruits and vegetables, than to her large planters of sugar and coffee.

H. P.

To the Senate and House of Representatives of the United States of America in Congress assembled :

The memorial of Henry Perrine, Doctor of Medicine, &c., and American consul at Campeachy, in Yucatan, respectfully sheweth :

1. That, on the 6th day of February, 1832, your memorialist respectfully directed from the city of New York, to your honorable assembly, a memorial in favor of the domestication of tropical plants in southern Florida, which resulted in the printed pamphlets of the 1st session of the 22d Congress, headed Doc. 198 ; Rep. 454 ; and H. R. 555, " A bill to encourage the introduction and promote the cultivation of tropical plants in the United States."

2. That said bill, conveying to your memorialist and his associates a township of land in southern Florida, on the condition that *every section* should be forfeited if at least one-fourth thereof should not be occupied and *successfully cultivated* in tropical and other exotic plants *within five years*, was reported on the 26th day of April, 1832, " read twice, and committed to a Committee of the Whole House to-morrow ;" which period has not yet arrived : and that, therefore, on this 29th day of December, 1834, he most respectfully directs, from the city of Campeachy, this supplementary memorial, to solicit that, during the actual session of Congress, the said *bill* may become a *law*, with such modifications as wisdom and justice may suggest.

3. That, as your honorable assembly has repeatedly granted, on certain terms, to various *foreigners* and their associates; different tracts of productive soils in settled districts of sovereign States, to encourage single objects of very partial utility ; and as your memorialist now solicits merely an *act of sale*, on similar terms, to a *native American* and his associates, of an equivalent portion of unproductive lands in the desert extremity of a subject Territory, to encourage many objects of very extensive utility, embraced in the most important enterprise ever proposed by an humble citizen of the United States to promote the prosperity of his country ; *and as the delay or advance of a single year, in the great geometrical reproduction of valuable tropical vegetables to supply the first seeds and plants for new staples of cultivation*, especially on sterile or ruined soils, and by a poor or feeble population, is of incalculable importance to a distressed agricultural community, he entertains the respectful hope that the modification and passage of the bill aforesaid will not be any longer delayed.

4. That, as southern Florida is not yet surveyed nor offered for sale, and as many portions of its surface are covered with conflicting claims, a special act of Congress is absolutely essential to ensure the right and safety of location to any individual in any part of its tropical territory ; and that hence your memorialist cannot, in any other way, obtain a *safe title to any land* for himself and associates, or the *indirect power* to combine strength of co-operation with perseverance of pursuit and unity of design in the introduction and cultivation of very productive tropical plants.

5. That, as both the Government and the people of the United States have hitherto considered southern Florida to be a *sickly and sterile* territory, in consequence of the inundated swamps of the interior, and of the arid sands of the coasts, and hence unworthy of even the trouble and ex-

pense of surveying and sale, your memorialist is aware that even the unconditional gift of a *section* of 640 acres of *slandered soil* to every settler, will be insufficient *alone* to attract emigrants while Texas continues to bestow a *league* of 4,428 acres of *eulogized soil* to every family, and while Government continues to recommend the gratuitous distribution of more inviting lands; yet, he nevertheless continues firmly persuaded that the facts and arguments connected with its *favorable climate* which he can offer *with* the legal divisions of the legal grant, will induce an adequate number of individuals to engage with him in the propagation of tropical vegetables in even the natural swamps and sands of tropical Florida; and that he attaches still greater importance to the *law* itself than to the *land* it may ensure, as by indicating a favorable opinion of his services and suggestions, it may have a recommendatory value to attract also a sufficient amount of capital to accelerate and extend this highly important enterprise.

6. That an act of Congress "to promote the introduction and extend the culture of the vine," a single extra-tropical plant, did convey to J. J. Du-four and his associates a certain tract of exceedingly fertile soil in an extremely valuable situation, by which said foreign grantees were greatly benefited, although the experiment did fail: that your memorialist, however, solely solicits an equivalent act "to encourage the introduction and cultivation of all valuable tropical plants," which may convey to himself and associates an equivalent quantity of absolutely steril soil, in an absolutely worthless situation, by which the native grantees will be entirely ruined if their experiment should fail: and that, as he will even be content with a *mere pre-emption right* to spend their labor, health, and wealth in experimenting the existence of a *tropical climate*, and, therefore, *productive atmosphere*, however *unproductive* may be the barely occupable *earth* of southern Florida, he most respectfully trusts that neither constitutional scruples, corporate insensibility, nor political hostility, may impede the concession of a mere right of location by the present Congress, however late in the actual short session this humble memorial may arrive at Washington.

7. That if, indeed, Southern Florida be so worthless a territory as it is generally supposed to be, both by the Government and the people of the United States, the absolute gift of all its swamps and sands to *native citizens*, cannot be of any pecuniary loss to the nation; and that, if any *native settlers* can find or cause any part thereof to be of any pecuniary value to themselves, they should receive it for their discovery or labor alone: but that your memorialist does not solicit the title to any tract as either an absolute or a conditional gift; and that he will even be content to obtain the safety of location by positive purchase at the Government price for much better lands, payable whenever the adjacent territory shall be surveyed and sold; as he is persuaded that, if the domestication of tropical plants shall be successful, he and his associates then will be able to pay for their respective sections; and that, if the experiment shall be unsuccessful, Government will be unable to sell those unproductive lands.

8. That if Congress should merely afford that indirect encouragement to the propagation of tropical plants which would result from the *immediate* survey and sale of southern Florida, and from the *immediate* restoration of revenue duties on all tropical products, this supplementary memorial would not molest your honorable assembly with the very humble

petition for special accessibility to thirty-six sections of land, on *such conditions* as to render them *barely possible means* of attracting associates and funds to continue an arduous enterprise which he has pursued during seven years, unaided and alone, although acting under express instructions of the Government of the United States, contained in the Treasury circular of the 6th of September, 1827.

9. That, although the prospective services of your memorialist should alone be considered amply sufficient to ensure the immediate passage of a conditional law, similar to the humble bill rudely sketched at the end of this memorial; yet, duty to his family induces him to add that, in obedience to the Treasury circular aforesaid, your memorialist has long continued to render extremely important services to his country, by the careful collection and transmission of very valuable vegetables, and of still more valuable facts, at a great sacrifice of wealth, labor, and health, which could not be compensated by the price in money of a township of our most fertile soils.

10. That, for some testimonials of some portion of his services, your memorialist most respectfully refers to the aforesaid congressional pamphlets, headed Doc. No. 198 and Rep. No. 454 of the 1st session of the 22d Congress; to such of his subsequent communications and accompanying documents as may have reached the files of the Departments of State, of the Treasury, and of the Navy; and to such others as may have appeared in the pages of the periodicals of agriculture, of medicine, and of science; but that as many letters have been destroyed by accident, and *by design*, on their passage to the United States; and as serious sickness has been the continued result of his extraordinary services to the people of Campeachy during the horrible cholera of June and July, 1833, a much greater amount of valuable information must be buried with his shattered frame in a foreign land, unless he can soon acquire the means of rendering it useful in his native country; yet, that it will nevertheless be found by such limited documents alone as may appear before a committee of Congress, that your memorialist is the only American consul who has entirely devoted his heart, mind, and body towards the introduction and acclimation of tropical plants; and that his zeal, patience, and perseverance in the pursuit, under the almost incredible obstacles interposed by man, nature, and Providence, will prove that he pre-eminently possesses the passion and the power of persisting in his purposes to promote the prosperity of the public by propagating productive, profitable, perennial plants.

11. That your memorialist especially refers to his letter of the 12th of September, 1833, to the Secretary of the Treasury, for a list of the principal plants whose seeds, roots, and shoots he had then forwarded to southern Florida in the nine previous months alone, through all the additional obstacles interposed by the destructive cholas of Havana, New Orleans, and Campeachy; embracing many species of valuable vegetables which yield very farinaceous roots, highly delicious fruits, celebrated healthy beverages, peculiarly precious oils, permanent colors, grateful odors, narcotic leaves, capsular fibres, cortical fibres, and *foliaceous* fibres; and that he has continued his endeavors to increase the numbers and varieties there, up to the present date, as far as possible, during merely brief intervals of disease, for the collection of plants, and with only occasional opportunities, by indirect routes, for the transmission of them from the peninsula of Yucatan to the peninsula of Florida.

12. That, as nearly all the valuable vegetables which your memorialist has sent in seven years to the different ports of the United States have perished by neglect after their arrival, because Government had not appointed any specially responsible agent to preserve the exotics ordered by its own Treasury circular of the 6th of September, 1827 ; and as he, therefore, apprehended that many useful plants might suffer the same fate in Florida, notwithstanding his precaution of engaging a private agent there to take care of them, he has availed himself of the direct intercourse between Campeachy and Havana, to forward also to the royal collection of exotic plants in Cuba, the peculiar productions of Yucatan ; in return for which, he has obtained, with the friendly correspondence, the voluntary promise of Dr. Ramon de la Sagra (Professor of the Botanical garden and Director of the pattern plantation near that city) to promote the progress of an acclimating nursery in southern Florida with all the species of tropical vegetables, native and exotic, with which royal bounty has enriched the domesticating nurseries of that island.

13. That your memorialist most respectfully invites the attention of a republican Congress of the United States to the royal orders of Spain, dated the 22d April and 10th November, 1829, which manifest the recent enlightened policy of the parent Government in effectually promoting the *immediate domestication*, in Cuba, of all profitable plants of all tropical countries ; the subsequent *transfer* of them all to the Canary islands for *intermediate acclimation* ; and the final *conveyance* of the whole to southern Spain for *gradual acclimation* throughout the whole European peninsula : by which means, the Indigo plant of Guatemala is now travelling to be cultivated by her poorest laborers, and manufactured by the cheapest process of extracting the dye by *simple infusion of the dry leaves* ; and the Cochineal plant and insect of Oaxaca are already propagated and prepared with increasing profit to that unhappy nation.

14. That, therefore, your memorialist more earnestly solicits the attention of your honorable assembly to the various communications in which he has not only shown that the characterizing phenomena of tropical climates—a dry warm winter ; a wet refreshing summer ; a breeze from the sea by day and from the land by night ; and a continual trade wind—all extend up to 28° north latitude ; but also, that below that parallel, southern Florida, by the narrowness and non-elevation of its surface, by its direction towards the south and east, by the westwardly course of the trade wind in its latitude, and, moreover, by the steady high heat of the Gulf stream from the equator, enjoys a still greater *uniformity of temperature*—the grand desideratum for *human health* and *vegetable growth*—than any island, peninsula, or continent, of greater breadth and elevation, within the torrid zone.

15. That your memorialist, moreover, respectfully represents, that however diversified the climates of our twenty-four existing States, the one great evil of *variability of temperature* is common to them all ; *sudden changes cutting off* the tropical corn of Maine and the tropical cane of Louisiana with the *frosts* of spring and of autumn, and *carrying off* the farmer of the North and the planter of the South with *consumption* of the lungs and of the liver ; that hence, our invalids who are declining with northern disorders of the thorax, or southern disorders of the abdomen, derived from the *variable* temperature of one section of the Union, merely increase or exchange disease by removal to the *equally variable* temper-

ature of the other ; that, however diversified the climates of the most eulogized portions of the whole belt of the world above 28° N. lat., embraced in the miscalled *temperate* but really *variable* zone, *equally great and sudden vicissitudes of temperature are common to them all* ; that, hence, our consumptive invalids who annually crowd to southern Europe, most generally perish in the vain search of the natural remedy of *an equable temperature*, which can be found only in the slandered torrid zone, or in tropical climates, among the mingled fruits and flowers of evergreen bowers, unvisited by the curse of cold ! and that, therefore, southern Florida, by the benignity of its climate, the proximity of its position, the form of its government, and the character of its people, combines more natural, social, and political advantages for a *warm dry winter* asylum of our sickly voyagers, than France or Italy, Colombia or Cuba, or any other portion of the world.

16. That your memorialist has moreover shown that the *same equability of temperature* of southern Florida which is so favorable to *human health*, is so much more favorable to *vegetable growth*, that the *fertility of its atmosphere* will overbalance the *sterility of its soil* ; that its complete enjoyment of the *best climate of the tropics* is absolutely demonstrated by the actual growth of the *tenderest plants of the tropics*, including the Banana plant and the Cocoa palm, universally admitted to be the greatest blessings of God to man ; that, hence, all the *hardest plants of tropical regions* will undoubtedly thrive in *similar soils and situations* of its tropical territory, embracing the Cassave, the Cochineal, the Henequen and *Pita* plants, the Ticu, the Morriche, the Gomutus, and the Jaggery palms, and *many more hardly* productive plants of exceedingly great importance to mankind ; that, as many such valuable vegetables of tropical climates are actually disseminated by birds and beasts, and do absolutely even *spread themselves* in miry marshes and arid sands, throughout dense forests, and over desert plains, in every tropical territory where a single individual may have arrived by accident or by design ; and as they include the celebrated medicines of Peruvian bark, Ipecacuanha, and Sarsaparilla, the delicious fruits of Laseh, Mangosteen and Durion, the nutritive drink of Chocolate, the farinaceous food of Sago, and many other *perennial plants* whose *spontaneous products alone* will afford a healthy and comfortable subsistence to the human race, the *profitable propagation* of tropical plants may be *immediately* commenced on even the *natural unimproved surfaces* of tropical Florida ; that, as the course of the Gulf stream and the origin of St. John's river, or the varied direction of many rivulets, indicate the swampy and marshy interior of southern Florida to be more *elevated* than its sandy and stony coasts, the same canals which may *drain* its inundated *marshes* will *irrigate* its arid sands, and furnish water-power and water-carriage for the preparation and transportation of the products of both ; and as it is thus so easily susceptible of great improvement for all forms of vegetation and all classes of population, for the production and preparation of the Tea, the Coffee, and the Pepper plants, and of all other vegetables which delight in the sunshine of cultivated fields, and afford employment to the feeble in health, sex, and age, the *profitable cultivation* of tropical plants may be *speedily* commenced on the *artificially improved surfaces* of tropical Florida ; and that, therefore, contemplating the *many profitable plants* which may be *immediately propagated* in the *shade*, and the numerous *valuable vegetables* which may be *speedily cultivated* in the *sun*, of south-

ern Florida, and combining the *superiority* of its *climate*, of its *products*, of its *formation*, of its *position*, of its *people*, and of its *Government*, it presents much greater advantages for an *easy productive permanent location* of our agricultural emigrants than Texas or Cuba, or any Spanish American state or colony, where military anarchy or abject servility prevails ; than Jamaica, or any other West India island which is menaced by the black cloud of fanatical emancipation ; than any and every portion of the whole torrid zone, inhabited by an indolent, ignorant, immoral, and intolerant population ; *and that it indeed forms the only tropical territory on the globe in which tropical vegiculture can be pursued by the best species of the human genus under the best Government in the world.*

17. That your memorialist has not only shown that many valuable vegetables of the tropics, after *temporary domestication* in southern Florida, may be *gradually acclimated* and *profitably propagated* in the most *steril districts* of the Southern States, but also that there may be *immediately introduced* various *productive perennial* plants which will *propagate themselves* in the worst natural soils, and which are still more productive when aided by the least care, capital, skill, or labor of man ; that he has especially recommended several tropical plants which combine the merits of yielding the greatest possible products, with the least possible labor, in the poorest possible soils ; whose introduction will, therefore, be an equivalent to the direct addition of *absolute fertility* to the most sandy, stony, and swampy surfaces, or hitherto most *steril districts*, and of *positive wealth* to the youngest, oldest, and feeblest, or hitherto *poorest population* ; that hence flour, sugar, and *foliaceous fibres* may be more profitably produced in the refuse lands of Carolina and Georgia, than flour, sugar, *cortical and capsular fibres* in the richest sections of Ohio and Louisiana ; that even their *ruined fields* will yield greater prosperity in the production of *foliaceous fibres*, than was ever obtained from their *virgin loams* by the cultivation of *capsular fibres*, notwithstanding the latter constitute more than one-half of the whole value of the annual exports of the United States ; that, as the *narcotic leaves* of one native plant of Yucatan (which *did* take its name from the dependent province of Tabasco) do actually afford an annual exportation of six millions of dollars in one staple of the South, so the *fibrous leaves* of another native plant of this peninsula (which *may* take its name from the exporting port of Sisal) will more probably afford an annual exportation of ten times six millions of dollars in another staple of the South, still more important than all her present staples combined, not merely for the *value* and *profit* of the *product* itself, but also for the *character* of the *lands* and of the *population* it will employ ; and that, finally, the propagation of the *fibrous Hennequen* Agave, and *farinaceous cassave* Jatropha of Yucatan, of the *coloring Cochineal* Cactus of Oaxaca, and of the saccharine Jaggery Caryota of Ceylon, and of other most valuable species of tropical plants of the same *hardy* natural families of Bromeliaceæ, Euphorbiaceæ, Cactæ, and Palmæ, will extract inexhaustible materials of agricultural wealth from the actually worthless sands and marshes of the Southern States ; and which will afford correspondingly profitable employment to the actually unoccupied lands and laborers of the Northern States ; and which will thus prove to be the most effectual remedies for relieving the general distress of our steril Atlantic States.

18. That, as the principal cause of the agricultural distress of the steril

districts of the *old* Southern and Northern States, is the extended cultivation of the *same* staples in the fertile districts of the *new* Southwestern and Western States; and as the completion of canals and railroads between the loamy banks of the Western rivers and the sandy shores of the Atlantic ocean will still further reduce the prices of the present products of the planters of the South, and of the farmers of the North; as foreign commerce, domestic manufactures, and even internal improvements, have ceased to be profitable pursuits; and as the great surplus of funds and laborers, let loose from them all, is swelling the great natural currents of our wealth and population, increasing through additional artificial channels to the fertile valleys of the Ohio and Mississippi, where agriculture is still attended with moderate gain, even the planter of the Southwest and the farmer of the West will soon be greatly injured by overproduction of their respective actual staples; and that hence the substitution of such *new staples* of agriculture as can be *propagated* on the *worst soils* of the *old States* more *profitably* than their *ancient staples* can be *cultivated* on the *best soils* of the *new States*, will prove to be both a natural *preventive* of the *future* distress of the *latter*, and an effectual *remedy* for the *present* distress of the *former*; and a happy preservative of a healthy *equilibrium* in the products, profits, and population of the four great divisions of the Union.

19. That your memorialist most respectfully solicits the *especial* attention of Congress to his various communications on the *propagation* of *fibrous-leaved* plants, and the *production* of *foliaceous fibres* in Florida and in all the Southern States; in which he has shown that they are *all hardy, productive, perennial plants*, which profitably *propagate themselves* on *sandy, stony, and swampy* surfaces, in the *sun* and in the *shade*; that their *fibrous leaves*, produced in any soil and situation, with the least care and cultivation, may be *cut* in any *weather* and every *season* of the year; that these *freshly cut leaves* may be *immediately* manufactured into excellent *paper*, at so cheap a price that it will become as important an auxiliary to popular education as the printing-press itself; that these living *perennial leaves* of endogenous plants will yield their fibrous contents in the shortest possible time, with the simplest possible preparation, as their *foliaceous fibres* are extracted from the *green leaves* by *simple scraping only*; that immediately after this mechanical separation, these *parallel longitudinal fibres* are ready for baling, exportation, or manufacture; that these *fresh foliaceous fibres* (so great is their individual strength, elasticity, and length) may be *instantly* wrought, *untwisted*, into very cheap forms and fabrics, for which the *unspun cortical fibres* of hemp and flax are entirely *unservicable*; that moreover the *foliaceous fibres* are so much *cheaper, lighter, stronger, longer, more elastic, and more durable* than *cortical fibres*, that they can be *spun* into thread, twine, and cordage, and woven into cloths finer than cambric and coarser than canvass, which will become superior substitutes for similar fabrics of flax and hemp for the general consumption of mankind; that furthermore, many of said *fibrous-leaved* plants form excellent hedges for themselves and for other objects of cultivation; that the *entire leaves* of many species constitute the best materials for the simplest manufacture of the cheapest possible matting, bagging, and other envelopes of merchandise; for the really *domestic manufactures*, or farm, family, and female manufactures of hats, bonnets, &c., by an innocent, independent, and rural population;

that, hence, the *propagation of fibrous-leaved plants* will form a more distinguished epoch in the agricultural prosperity of our Southern States than the invention of the cotton-gin; that the *production of foliaceous fibres* will create still more beneficial revolutions in the manufactures and commerce of all civilized nations than has yet been effected by the cultivation of *capsular fibres*; and that, therefore, their introduction to the intelligent industry of our free institutions should be effectually favored by the statesmen of our nation and the philanthropists of the world.

20. That your memorialist has thus discovered *in the unappreciated climate* of our southern Florida, a fountain of human health, and a mine of vegetable wealth, which will save the lives of our consumptive invalids, and prevent the emigration of our healthy agriculturists to foreign countries; that he has thus moreover discovered, *for the unappreciated soils* of our Southern States, the most effectual means to cover them with a dense population, extract riches from the ruined fields and refuse lands of the South, and afford profit to the surplus funds and extra laborers of the North; and that he has hence thus shown the most effective means to preserve and promote the peace, population, prosperity, and permanency of the Union.

21. That your memorialist has moreover shown, not only that the cultivation of all tropical staples within our territory is *entirely practicable*, and *positively profitable*, to furnish products for *foreign exportation*, but also that it has actually become *absolutely necessary* to ensure supplies for *home consumption*; and that he therefore concludes with the respectful request, that, pardoning the defects of a memorial written in a sick hammock, a special committee of Congress may take into immediate consideration his various suggestions in favor of the direct domestication of tropical plants in general, and of fibrous-leaved plants in particular; and may speedily report upon the expediency of an immediate establishment of a national acclimating nursery in southern Florida.

And your memorialist, &c.

HENRY PERRINE.

CONSULATE U. S. A. AT CAMPEACHY,

December 29, 1834.

A BILL to encourage the introduction and promote the cultivation of tropical plants in the United States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in consequence of the services and suggestions of Doctor Henry Perrine in favor of the immediate domestication of tropical plants in southern Florida, and of their gradual acclimation throughout the Southern States, there be, and is hereby, granted to him and his associates, the pre-emption rights to thirty-six occupable sections of land in the peninsula of East Florida, below the parallel of 28° (or 26°) N. lat.: *Provided*, That they shall not embrace sufficient quantities of naval timber to be reserved for the United States.

Sec. 2. *And be it further enacted*, That the said sections of land shall be located by said Henry Perrine, and surveyed, under his direction, by the surveyor of Florida, within two years from this date; and that it shall

be lawful for each and every grantee to enter upon and take possession of the respective section or sections which may be assigned to him or them by the said Perrine, for the propagation of tropical plants.

Sec. 3. *And be it further enacted*, That, at the expiration of ten years, or as soon as revenue duties shall be laid again on all tropical products, ports of entry be established along the coasts, and the other obstacles removed, or as soon as the territory adjacent to said lands shall be sold, a patent shall be issued to said Perrine and his associates for any and every section which shall be actually inhabited by a bona fide cultivator of tropical plants; on the payment of the minimum price per acre within that time; and at any previous period, for any legal division of any section aforesaid, on the payment of the same price, with a deduction of six per cent. per annum.

CHARLESTON, September 22, 1837.

SIR: It becomes my duty, as corresponding secretary of the South Carolina Agricultural Society, to transmit you their report on the subject submitted to them by you. They have instructed me to write to Mr. H. S. Legare, our representative in Congress, and, by their resolve, request his aid in furthering your patriotic undertaking. I have done so; and he will await your presenting him with the report, (of which he has no copy,) and will, no doubt, comply with the wishes of the society. The report will also be published in the coming number of the South Carolina Agricultural Journal, published in Charleston.

I have the honor to be your obedient servant,

WILLIAM ROPER,

Secretary of the South Carolina Agricultural Society.

To Dr. H. PERRINE.

The committee to whom were referred the specimens of foliaceous fibres, brought from South America by our intelligent and enterprising countryman, Dr. H. Perrine, and the subject of the acclimation of tropical plants, respectfully report:

That, after an attentive review of the documents in his possession, and a careful examination of the specimens presented, they attained the conclusion that Dr. Perrine must have sacrificed much time, a large amount of professional emolument, and endured considerable labor and annoyance, in procuring and forwarding the plants hereafter described; which, should they be acclimated, and found to flourish in any part of our country, will be of distinguished advantage in one of the most useful departments of human industry, viz: in nautical affairs. The jealousy of the South Americans is such, that they not only withhold all aid from foreigners, but actually prohibit the transplantation of any of the products of their soil and climate. In consequence whereof, Dr. Perrine was compelled to avail himself of the gratitude of the Indians, whose families had received his medical aid gratuitously, to procure and remove the plants; upon whose habitually suspicious and jealous minds no pecuniary remuneration would have had any persuasive efficacy. The specimens exhibited were the following: *Agave Sisalana*, and commonly called the *Sisal hemp*; of this, there are two varieties, which flourish in stony or sandy sterile soils; its fibres are remarkably strong; and make the most beautiful and apparently

strongest rope or cable. It is asserted that they hold the South American vessels during the peculiarly violent hurricanes of that climate, when European ships, moored with iron chain-cables, and those of Russia hemp, are continually parting from the latter, and drifting at the will of the tempest. It is admitted by our own naval officers that it makes the finest rope for running rigging. It makes, also, fine thread for sewing, and materials for bags and canvass work. The mode of preparation is very simple, requiring no rotting, &c., but only to have the green rind scraped from the leaf by a sharp-cornered stick, resembling a two-edged wooden sword, about two feet in length; after which process, (which is a quick one,) the fibres are ready for use. The next specimen was the *Bromelia Pita*, considered as a substitute, and that too of a superior character, for flax. It propagates itself in a shady sandy soil; the mode of preparation similar to that described. The prospect of these plants becoming acclimated, by a fair experiment, is strengthened by the fact that the *Agave Virginica*, though inferior in character, is found as far north as the State from which it derives a part of its name. A striking merit recommendatory of the attempt to introduce and propagate these foliaceous fibres, is the adaptability and facility of their cultivation in the poorest and most sandy soils of Carolina and our Southern section; in this respect resembling our palmetto, which also furnishes a fibre that might be made useful, though of an inferior quality. Of the value of the yield of these plants, a statement was exhibited of an investment of \$10,000, the precise result of which we do not recollect; but are fully persuaded that, at the end of three years, the nett profit was unusually great. In addition to the above, Dr. Perrine has, for many years, devoted his zeal and talents to the forwarding to southern Florida of many species of valuable vegetables, which yield farinaceous roots, delicious fruits, healthy beverages, precious oils, &c. of whose fate he cannot precisely tell, owing to the distressed state of the country. Your committee cannot, in conclusion, do otherwise than recommend Dr. Perrine's enlightened efforts to the favorable construction and support of his countrymen, and especially to the patronage and fostering aid of Congress, believing his aim to be the offspring of that honorable ambition which delights

"To scatter plenty o'er a smiling land,
And read its hist'ry in a nation's eyes."

[From the Southern Agriculturist.]

Acclimating Nursery of Tropical Plants.

We publish the following letter from Dr. Perrine with great satisfaction, believing, as we do, every man who adds to the productions of his country, acquires for himself a claim upon the gratitude of the public. It is much to be regretted the unsettled state of the country has so far deranged the doctor's plans, as to compel him to locate a temporary nursery at Key West.* The enterprise is every way praiseworthy, and we hope

*Finally commenced at Indian Key, in August 1833, where upwards of 200 species and varieties are planted in boxes for removal to the main land, when the Seminole war shall cease. See extracts of letters from Charles Howe, Esq., inspector of the port and postmaster at Indian Key, and of extracts of letters from J. Dubose, ex-inspector and light-house keeper at Cape Florida.

H. P.

will prove eminently successful. So far as this work and our efforts can advance the views of Dr. Perrine, they shall have our cordial support. We are sorry a catalogue of seeds and plants did not accompany his letter, as no doubt the variety is great, and would the more readily command the attention of the liberal and patriotic citizens of the Southern States. Much time, attention, and labor, have been expended in procuring the means of establishing a nursery, and, as "the laborer is worthy of his hire," we hope Dr. Perrine will receive a liberal remuneration from a generous public.

"KEY WEST, (*Tropical Florida*,) June 30, 1837.

"MR. EDITOR: Having long been a fellow-laborer in the great field of *vegiculture*, I respectfully address a few lines to your favorable consideration. With a large collection of seeds and vegetable products of Yucatan, I left Campeachy on the 28th of January last, and arrived at New Orleans on the 11th of February, with the intention of proceeding by the first opportunity to the vicinity of Cape Florida, to commence my acclimating nursery of tropical plants. Having, however, waited in vain for a direct passage to this place, on the 5th of June I embarked for Havana, which city I left on the 15th, and arrived at Key West on the 17th instant. The renewed hostilities of the Seminoles at the southern extremity of the peninsula have rendered it impossible for me to locate myself on the main land, and hence my present impressions are in favor of selecting a spot in this or some other islet, to plant my seeds, and to make a *preparatory* garden or nursery. This new disappointment of my cherished plan renders me still more anxious to excite some sympathy among the patriotic friends of the enterprise of acclimating tropical plants, which I have pursued upwards of nine years, unaided and alone. I therefore transmit to you a copy of a circular by ex-Governor Roman, president of the Agricultural Society of Louisiana, intended to be directed to the presidents of all the agricultural societies of our Southern and Southwestern States, in which societies exist, and to the Governors of such of the same States as have not yet organized such societies. As my residence in Mexico prevented my gaining access to the files of the *Southern Agriculturist*, I am ignorant of the condition of South Carolina in that respect; and therefore leave blank the direction of the aforesaid circular, with the hope that you will be kind enough to fill it with 'to the President of the Agricultural Society of South Carolina,' or 'to the Governor of the State of South Carolina,' as circumstances may require.

"Should you, besides directing said circular, be also so kind as to publish it in your periodical, my gratitude shall be yours, and will be manifested in any way you direct. I believe that I have many quires of manuscript, whose publication in the *Southern Agriculturist* might be acceptable and profitable to your readers; but, until I can peruse your back numbers, my communications might embrace matters already before them, and hence my unwillingness to risk any thing previous to the acquisition of your back volumes. As I have no botanical works of the United States of a later edition than Eaton's Manual for 1833, I must take for granted that the latter contained the names of all plants, both indigenous and exotic, known at that period, until I can acquire a list of the plants subsequently discovered and introduced by others. A list of the tropical plants introduced by myself shall be at your service. In short, I believe that you and

myself can be mutually serviceable to each other in our respective undertakings, and to the agricultural prosperity of the whole Southern and Southwestern States. You will pardon the defects of this hasty and desultory communication ; and I shall be greatly gratified by a few lines in return, the ensuing mail. *Should* I proceed to Washington this summer, my route will likely be *via* Charleston, when I shall do myself the honor to call on you, and exhibit some samples of the vegetable products of Yucatan.

“Very respectfully, your obedient servant,

“HENRY PERRINE.”

The following letter and resolutions show Dr. Perrine's exertions have been untiring, and are properly appreciated by those who are personally acquainted with him, and know best the value of his acquisitions. The letter and resolutions being an open circular, intended for the Governor of this State, we have thought proper to insert them here, as the best means of bringing the subject under the consideration of our agricultural societies.

NEW ORLEANS, June 1, 1837.

SIR : I respectfully invite your attention to the following resolution of the agricultural society over which I have the honor to preside, and also to the appended resolutions of the Legislature of this State, which were presented by a director of the society. The preamble to the resolutions of the Legislature expresses our motives for thus endeavoring to facilitate the persevering enterprise of Dr. H. Perrine; and I may add, that my personal knowledge of himself and his services induces me to hope that the agricultural society, and the Legislature of your State, will render him some assistance, at least towards the passage of the bill alluded to, during the ensuing session of Congress.

Very respectfully, your obedient servant,

A. B. ROMAN,

President Agricultural Society of Louisiana.

Resolved, That the president of the board be, and he is hereby, authorized to make such arrangements as he may deem proper, with Mr. Perrine, for the publication, at the expense of the society, of such part of his writings as may promote the interests of agriculture ; and to procure from Havana and other parts, through Mr. Perrine, such plants as in his opinion may become acclimated here.

The foregoing is a true copy from the journal of proceedings of the Agricultural Society of Louisiana, at its meeting of the 7th of March, 1837.

EUG. ROUSSEAU,

Secretary Agricultural Society of Louisiana.

NEW ORLEANS, May 27, 1837.

(No. 96.) *Resolution.* Whereas, in obedience to the Treasury circular of the 6th September, 1827, Dr. H. Perrine, late American consul at Canipeachy, has been distinguished by his persevering exertions to introduce tropical plants into the United States : and whereas the Committee on

Agriculture in Congress, on the 22d April, 1832, did report a bill to encourage the introduction and promote the culture of tropical plants in the United States, by conveying conditionally to said Perrine and his associates a township of land insouthern Florida : and whereas the gradual acclimation of tropical plants in all the Southern and Southwestern States may be better accomplished by their intermediate domestication in the tropical district of Florida :

Sec. 1. *Be it therefore resolved by the Senate and House of Representatives of the State of Louisiana in General Assembly convened*, That our Senators in Congress be instructed, and our Representatives requested, to procure the passage of said bill into a law, under such conditions as may best comport with the public good.

Sec. 2. *And be it further resolved*, That the Governor be instructed to forward a copy of this resolution to each of our Senators and Representatives in Congress.

ALCEE LABRANCHE,
Speaker of the House of Representatives.

C. DERBIGNY,
President of the Senate.

Approved March 11, 1837.

E. D. WHITE,
Governor of the State of Louisiana.

A letter extracted from the report of the Secretary of the Treasury, transmitting information relative to the services and researches of Doctor H. Perrine under the circular of September 6, 1827.

TAMMANY HALL, NEW YORK, *March 21, 1832.*

SIR: The subscriber yesterday saw the first resolution reported on the 14th by the chairman of the Committee on Agriculture, inquiring of the Department whether the American consul for Campeachy has made any researches, and rendered any services, in compliance with the Treasury circular.

It is respectfully considered by the subscriber that his communications on the logwood, the agaves, and the cochineal, are alone evidences of a great extent of researches, in a country where the obstacles to observation and inquiry are so numerous and enormous as they are in Mexico. He did not burden the Department with detailed intelligence of many plants of *partial* utility, believing that the journals of medicine and other sciences would be supplied with them through his private correspondents, and that the objects of the circular would be thus most conveniently accomplished. It would require the labor of two or three months to arrange and copy all the correspondence and other documents relative to Mexican plants now in the possession of the subscriber; and then "the nature and extent of those researches and services" would not be completely exhibited, in consequence of the unsettled state of the papers of the late Doctor Samuel L. Mitchill, and of the blanks occasioned by the

miscarriage of letters to and from other gentlemen. The executor of Doctor Mitchell, (Doctor Akerly,) has promised the subscriber to select his correspondence as soon as possible. Some of his letters to the deceased have been published in the New York Farmer and Horticultural Repository, and the others will appear in the shape most agreeable to the relatives of that celebrated philosopher. The Annals of the Lyceum of Natural History of this city, the pages of the Journal of Science of New Haven, and the numbers of the periodicals of agriculture and of medicine in various parts of the United States, it is believed, will ere long afford a satisfactory reply to the resolution aforesaid of the Committee on Agriculture.

The Department is already apprized not only of the great obstacles to observation and inquiry in the consular district of the subscriber, but also of the almost insuperable impediments to the collection and transmission of plants, and of the time and labor which were wasted before he became convinced that it was absolutely necessary to depend only on his own eyes and his own hands in the acquisition of intelligence and the collection of vegetables. Without roads or carriages in that country, not one attempt in a dozen was entirely successful in getting the plants from the interior to Campeachy. On their arrival, new difficulties occurred in preserving them from accidental and intentional injury. Then their transmission to the United States was impeded by the rarity of vessels sailing *directly* to the Northern ports, and by the character of those which went to New Orleans, being mostly the property of Spaniards or Mexicans. Neglect, jealousy, or direct hostility, prevented their reaching their destined port, in most instances; and in others, after their arrival in the United States, delays, carelessness, and accidents combined to let them perish. The agents of the subscriber in Sisal, Laguna, and Tabasco, not being animated by his ambition, seldom executed his orders effectually or in time. The internal dissensions of the Mexicans frequently added their embarrassments to the train of disappointments: in short, the comparative fruitlessness of all his labors to transmit tropical plants occasioned his letter to the Department of the 8th November last. The amount sacrificed in his profession alone, by his services and researches in obedience to the Treasury circular, is shown by the testimony of Doctor Johnson, a personal acquaintance of General Root. The memorial of the subscriber, however, does not found his prayer for a grant of land on his past researches and services alone. It distinctly prays for it as an encouragement to his future services for the introduction and domestication of tropical plants. Unless he can offer land in the southern extremity of Florida for that purpose, he knows not how he can obtain associates in the enterprise. Texas is carrying off thousands of our agricultural citizens, by offering *sittios* of more than 4,000 acres to every family. The subscriber could not reasonably expect that, under these circumstances, any settler would accept less than a section in Florida, burdened with the condition of cultivating a given quantity of tropical plants.

If the territory south of 26° N. were surveyed and in market, he should not molest Congress with his memorial. If he could obtain even the pre-emption right to a sufficient number of sections to form a settlement of a hundred families, he would not ask for a township of land. He is now prepared to sail for Campeachy in fifteen days, with all the books, &c., requisite to make his future services more valuable.

His funds and his labors shall continue to be devoted to the great enterprise of domesticating tropical plants, whatever may be the fate of his application to Congress.

I have the honor to be, sir, very respectfully,

Your obedient servant,

HENRY PERRINE.

To the HON. SECRETARY OF THE TREASURY, &c.,

Washington city.

Note by H. P., 5th February, 1838.—As the Committee on Agriculture are unwilling to republish all the documents which accompanied the report of the former committee on the 26th April, 1832, the subscriber begs that the members of both Houses of Congress will attentively refer to the documents pointed out in his supplementary memorial of the 29th December, 1834.

HENRY PERRINE.

No. 111 of the Palanca, Periodico del Estado de Tabasco, Federacion Mexicana,
June 11th, 1831.

EDITORIAL NOTICE.—[TRANSLATION.]

“ We have the sorrow to announce the proximate departure of the citizen Henry Perrine, consul of the United States of the North in this State, and whose absence is generally regretted on account of the just regard he won by his humane labors and philanthropic pursuits. His elevated knowledge in medicine had made this sage man the extraordinary resource of diseased persons of all ranks and qualities; and we anxiously desire, in consonance with public opinion, his prompt regress to this republic.—[The EDITORS.]

Copy of a letter of Colonel White, Delegate from Florida.

WASHINGTON, *April 24, 1832.*

DEAR SIR: I have drawn the bill and report, and placed them in the hands of the committee, who meet to-morrow to consider and report upon them. I now return you the honorable testimonials* of your industry, talents, and character, which are no longer needed here. I hope to have the pleasure soon to send you the bill and report.

With great respect, your friend,

JOS. M. WHITE.

Doctor H. PERRINE, *New York.*

[From the New York Farmer.]

To the intelligent friends of the Union :

The great prosperity to be derived from the cultivation of a single species of exotic plants, *was* shown by the old Southern States, in cotton; *is* exhibited by Louisiana, in sugar; and may soon be felt, in some other staple, by the whole confederation. Unlike manufactures, the

* Official documents on a dozen leaves of stamped paper from all the chief authorities, military and civil, of the State of Tabasco, viz: the commanding-general and commissary general; the governor and vice governor; the judge of the district and mayor of the city, &c.

products of agriculture possess the internal power of rapid reproduction in a wonderful geometrical progression. A single grain of tobacco, which, in two years, would furnish only seed enough for a single field, in two years more will afford a sufficient supply to plant a hundred thousand fields ! One cochineal insect alone, whose progeny in one year would occupy the leisure of only one rural laborer, in one year more will give abundant employment to the leisure of one million of rural laborers. In a limited time and space, this extraordinary multiplication is as certain in practice as it is astonishing in calculation ; and hence the delay or advance of a single year in forming a *nursery of supply* for cultivators must be of incalculable importance to an agricultural community. The introduction of valuable vegetables to the industry of the South, is a sure and speedy remedy for its existing distress. Its large capital and fertile soils may still be devoted to the production of the short fibres of the dry pods of its annual *Gossypiums* ; while its small capitals and sterile districts may be transferred to the cultivation of the long fibres of the fresh leaves of the perennial *Agaves* ; and the resulting Henequen and Pita, as superior substitutes for the hemp and flax of Northern climates, will become harmonious associates with cotton, its ancient and principal staple. With the fibres of one exotic vegetable, our Southern States have hitherto furnished a material for the clothing of a great proportion of the human race ; and with the fibres of other exotic vegetables, they may hereafter supply the materials for thread, twine, and cordage, cambric and canvass, and diversified manufactures, to a great majority of the civilized world.

Besides the foreign plants which are principally valuable on account of the quantity or quality of their fibres, there are thousands whose varied productions are still more profitable, in proportion to the capital employed, which may be transferred from South America, Africa, and Asia, to our Southern shores ; and, once within the range of American enterprise, industry, intelligence, and ingenuity will become converted into mines of vegetable wealth, of which their barbarous native countries have never even dreamed. By the cultivation of the cactus cochinifer alone, the labor of merely the feeble in sex or age, at the South, may divert from Mexico its millions of monopoly in cochineal.

The foregoing considerations demand the *immediate* establishment of a nursery of tropical plants at or near Cape Florida.

The climates of the northern and southern halves of the peninsula of Florida are different in kind or distinct in character. Above 28° it possesses the *improved* climate of our Southern States, and below that parallel it enjoys the *improved* climate of the West Indies. St. Augustine resembles Charleston and New Orleans, in the humidity of its winter and the transitions of its temperature. Cape Florida resembles Matanzas and Campeachy, in the dryness of its winter and the uniformity of its temperature. The southern half of Florida has also the perpetual trade wind, the daily sea and nightly land breeze, and the rainy summer of the islands of Cuba, Hayti, Jamaica, and Puerto Rico, and of the whole peninsula of Yucatan. Hence it combines all the phenomena of a tropical climate, viz : a constant aerial current to the west ; an alternate land and sea breeze ; a delicious dry, and a refreshing wet season ; and a great uniformity of temperature throughout the year. But tropical Florida, as it may now be called, must be blessed with a still greater equality of temperature than either the islands of the West Indies or the

peninsula of Yucatan. It has not the *elevated* mountains of the former to chill and charge its atmosphere with thunder, lightning, storm, and rain: it has not even the *wide* surface of the latter to cool the air so greatly by night, or to heat it as greatly by day. But, above all, its happy equilibrium must be sustained by a friend peculiarly its own—the great Gulf stream, which cherishes the shores it embraces with the heat which it brings from the equatorial seas. The perpetual trade wind, in its passage across this warm river of the ocean, imbibes its equalizing temperature, and steadily distributes it, in travelling westwardly, over the whole surface of tropical Florida.

The whole extent, then, of southern Florida must present unparalleled advantages for vegetable cultivation and for animal enjoyment. By analogy with Yucatan, its atmosphere should become proverbial for healthiness. Consumption, which annually destroys fifteen per cent. of the population between Boston and New Orleans, should at least be as rare a disease as it is in Campeachy, where it is shunned as a virulent contagion; and the thousands of sufferers who are sent in its incipient stages to perish amid the sudden transitions of the south of Europe, may hereafter change their voyage to recover in the equable temperature of the south of Florida.

The eastern shore, however, possesses some advantages for a settlement which are not common to the western side. The trade wind arrives at it with the steady warmth of the Gulf stream, and the pure freshness of the ocean, which may be somewhat disturbed in its course across the interior by the variations and exhalations of the soil; and vessels bound to it will not be exposed to that delay in time, or those dangers in navigation, which necessarily attend a voyage round Cape Sable. But especially in reference to the location of the first nursery in Florida, the circumstance most essential to its success will be found in speed and safety of communication with the great commercial emporium of the North; as nine-tenths of the valuable exotics of the world can be obtained more easily and cheaply via New York, than in any other way.

You are respectfully referred to document No. 198 and report No. 454, of the last session of Congress, containing a letter from the Secretary of the Treasury, and a report from the Committee on Agriculture, for an outline of the past services and future plans of the subscriber, to accomplish the important enterprise of domesticating tropical plants in the United States. You will thence perceive that his hopes of ultimate success are founded on an act of the Legislative Council of Florida, incorporating, restrictively, a Tropical Plant Company, and on a bill of the national House of Representatives, granting, conditionally, a township of land; and that, consequently, if the company should finally be organized, and the bill become a law, one or two years must subsequently elapse before any available funds can probably be obtained from either measure, or both combined. Nevertheless, during the ensuing winter and spring the subscriber shall be employed in collecting the valuable vegetables of Yucatan and Tabasco, with the *hope* of transplanting them in Florida about the beginning of the periodical rains in May, and of thus commencing a permanent depot for the continued reception of superior species of all celebrated plants of the torrid zone. To realize this hope, an intervening accumulation of funds is essential for the transportation of a cargo of living plants, for the preparation of the soil to contain them, and for the maintenance of

a family to attend them in the unsettled vicinity of Cape Florida. This obstacle once overcome, he will ensure the rapid growth of a systematic garden of improved exotics, in which scientific arrangement, and even picturesque beauty, shall be blended with PRACTICAL UTILITY—the grand end and aim of his persevering ambition. Believing, then, that the astonishing importance of a single year, in the geometrical progression of a *distributing nursery*, will justify the trial of every honorable means to hasten the period of its formation, this hurried address is, therefore, respectfully submitted to the patriotic friends of the *speedy domestication of tropical plants*, with the humble expectation that it may excite a *subscription loan* for that purpose. The honorable J. M. White, the delegate from Florida in Congress, at Washington city, will take charge of all sums that may be thus advanced towards the contemplated nursery, and will return a receipt for the same to each subscriber, which will entitle him to an equivalent in plants or stock.

HENRY PERRINE,
Consul U. S. A. at Campeachy.

OCTOBER 4, 1832.

One thousand dollars will be paid by the subscriber for an *invention* to separate from the *fresh leaves* of the agaves those *fibres* which are called Sisal hemp, by a machine which will save as much labor as Whitney's gin in separating the seeds from cotton.

H. PERRINE.

We recommend the preceding circular to the effective consideration of every liberal mind. The friends of domestic industry must remember, that, by the last tariff, the enterprise is deprived even of that protection which was incident to a revenue duty on tropical productions. The members of our horticultural societies must see, in this contemplated nursery of Dr. Perrine, the national botanic garden which they have so long desired in the South. The proprietors of green and hot-houses must consider it as the speediest and cheapest means of filling them with rare and beautiful exotics. And every patriot must regard its immediate establishment as important in relation to the peace and prosperity of a now agitated community. We therefore sincerely hope that every "intelligent friend of the Union" will speedily and cheerfully contribute his mite towards the formation of this nursery of tropical plants in tropical Florida.

Editor of the Farmer.

Extracts of official letters from the Secretary of State in Washington to the American consul at Campeachy.

DEPARTMENT OF STATE,

Washington, October 19, 1833.

SIR: I have the honor to acknowledge the receipt, this day, of your letters of the 15th of July and 27th of August, and also of a copy of your letter of the 11th of September to the editor of the American Journal of

Medical Sciences; and a copy of the tribute paid to your professional and other services by the Ayuntamiento de Campeche. The zeal you have manifested in the cause of humanity and science is highly honorable to yourself, and I hope your efforts may be crowned with the success they merit.

I am, sir, respectfully, your obedient servant,

LOUIS McLANE.

HENRY PERRINE, Esq.,

United States Consul, Campeachy.

DEPARTMENT OF STATE,

Washington, January 8, 1834.

SIR: At the same time I received duplicates of your letters of the 22d of May and 27th of August. The uncommon exertions you have made in your scientific pursuits, all directed towards the benefit of your own country, are worthy of the highest commendation and encouragement; and I would cheerfully yield all the aid in my power to forward your interesting schemes for transplanting the productions of Goazacoalcos and Yucatan to the soil of southern Florida.

DEPARTMENT OF STATE,

Washington, February 12, 1834.

SIR: I have now to inform you that, in furtherance of the wish expressed in the postscript of your letter of the 29th of October last, I have written to the Secretary of the Navy, referring to your letters of the 22d of May, the 15th of July, and the 27th of August, 1833. A copy of my letter is enclosed.

[Enclosure :]

DEPARTMENT OF STATE,

Washington, February 12, 1834.

SIR: I have the honor of referring to you the within letters of the 22d of May, the 15th of July, and the 27th of August, 1833, from Mr. Perrine, the United States consul at Campeachy. The zeal of this gentleman is very commendable, and the object which he has at heart appears to be highly worthy of attention. In his letter of the 29th October last to this office, Mr. Perrine asks, "Cannot our naval vessels in this sea be directed to take on board, on their return for the United States, the pita plants of the forests of Goazacoalcos, and the henequen plants of the fields of Yucatan, for transplantation in southern Florida?"

I am, sir, respectfully, your obedient servant,

LOUIS McLANE.

HON. LEVI WOODBURY,

Secretary of the Navy.

DEPARTMENT OF STATE,

Washington, February 17, 1834.

SIR: It gives me pleasure to communicate to you the reply of the Secretary of the Navy to my letter of the 12th instant, recommending to his attention the subject of the transplantation of certain tropical plants in southern Florida.

[Enclosure :]

NAVY DEPARTMENT, *February 15, 1834.*

SIR: Yours of the 12th instant, transmitting three letters from Henry Perrine, Esq., consul of the United States at Campeachy, has been received. I have the honor to inform you that this Department will be happy to give any aid, in relation to the subjects named, which the existing laws may authorize. The letters are herewith respectfully returned.

I am, sir, very respectfully,

LEVI WOODBURY.

Hon. LOUIS McLANE,
Secretary of State.

DEPARTMENT OF STATE,

Washington, April 4, 1834.

SIR: This letter is written only for the purpose of acknowledging the receipt of your interesting communication of the 1st of February.

I am, sir, respectfully, your obedient servant,

LOUIS McLANE.

H. PERRINE, &c.

AYUNTAMIENTO DE CAMPECHE.

El respetable ayuntamiento de esta ciudad en sesion ordinario del 29 del ulto. Julio, acordó lo que sigue:

“Habiendo tomado en consideracion los estraordinarios y gratuitos servicios profesionales y morales que Don Henrique Pertine, doctor en medicina, Socio del Colegio de Medicos y Cirujanos en la Universidad de Nueva York, y consul de los Estados Unidos de America en esta ciudad, ha prestado á este vecindario en todo tiempo, y muy particularmente durante la epidemia, tanto asistiendo á los atacados de esta mal con la mas heroica, eficacia, como suministrandoles medicinas sin costo alguno, se acordó hacer una particular recomendacion de él al augusto Congreso del Estado, solicitando á la vez que hiciese una iniciativa al soberano Congreso de la Union, para que le conceda una carta de ciudadano, dispensandole los requisitos que previene la ley de la materia, y que entretanto se le pase oficio politico con insercion de este acuerdo; manifestandole lo reconocida y grata que le viva esta respetable corporacion por los inestimables servicios que en tiempo de mayor aficcion prestó al pueblo Campechano por quien dignamente representa.”

Y lo transcribo á V. en cumplimiento del acuerdo inserto, protestandole á la vez mi aprecio y distinguida consideracion.

Dios y libertad. Sala capitular de Campeche y Agosto 7 de 1833.

MANUEL ORTIZ.

ESTEVAN VALAY DE GONZALES, *Secretario*.

Señor Doctor Consul de los Estados Unidos de America,

DON HENRIQUE PERRINE.

Extract of a postscript to a letter to the Secretary of the Treasury, dated

CAMPEACHY, September 12, 1833.

As the annunciation of the subscriber that the improved climate of the torrid zone extends north of the tropic of Cancer into southern Florida is there already demonstrated by the growth of the banana plant and the cocoa-palm, (the two greatest blessings of God to man,) he annexes a list of some valuable vegetables of the tropics which he has been forwarding for Cape Florida; through all the impediments of the choleras at Havana, New Orleans, and Campeachy.

Nutritive roots: Jatropha manihot, two varieties; Marantha indica and allouí, two species; Arum sagittifolium; Dioscorea alata, sativa and bulbifera, three species; Alstræmeria edulis and latifolia, two species; phaseolus tuberosus, two or three varieties.—*Edible fruits:* Persea gratissima; Mangifera domestica; Anacardium occidentale; Anona squamosa and Muricata; Chrysophyllum caimito and oliviforme; Lucuma bomplandia; Mamea Americana; Tamarindus occidentalis; Melicocca bijuga; Moringa pterigosperma; Malpighia moureila.—*Coloring materials:* Bixa orellana; Curcuma Americana; Cactus cochinillifer.—*Oils:* Moringa pterigosperma; Alfonsia oleifera; Jatropha curcas.—*Cortical fibres:* Hibiscus tiliaceus; corhorus siliquosus.—*Capsular fibres:* Gossypium, two species kidney and nankin cotton.—*Odors:* Vanilla aromatica; Hibiscus abelmoschus.—*Foliaceous fibres:* Agave Sisalana; two varieties of Henequen; Furcraea foetida, or B. pita.—*Drink:* Agave Americana, ormaguey de pulque; Coffea arabica; Theobroma cacao.—*Naval timber trees:* Picidia erythrina; Cedrela odorata.—*Smoking:* Tobacco, various varieties of its native country.

H. P.

[From the New York Farmer.]

CONSULATE U. S. A., CAMPEACHY,

February 1, 1834.

To the Hon. SECRETARY OF THE TREASURY of the U. S., Washington:

SIR: The subscriber now presents a brief recapitulation of some facts and arguments in favor of the *immediate* domestication of tropical plants in the United States. He wishes thus to show, not merely that the cultivation of tropical staples is *practicable* in our territory, but also that it is absolutely *necessary* for home consumption; is positively *profitable* for the foreign market; and is highly *desirable*, in other respects, to promote the peace and prosperity of the Union.

The *practicability* of cultivating tropical productions in general, he has manifested with the facts that the peculiar climate of the tropics extends beyond the astronomical boundary, several degrees north, into our peninsular territory; and that the best plants of the tropics are actually flourishing in the southern portion of that peninsula, at Cape Florida. He has not only shown that below 28° southern Florida enjoys the dry warm winter; the wet refreshing summer; the breeze by day from the sea, and by night from the land, and the trade winds from the east, which are *common* to tropical countries in general; but he has also proved, by its narrow level surface stretching southeastwardly, by the hot ocean river running northwestwardly along its eastern shores, and by the greater steadiness of the westwardly wind in those latitudes, that tropical Florida is even *superior* to the elevated islands of the West Indies and to the broad peninsula of Yucatan, in that *uniformity of temperature* which is most favorable for vegetable growths, animal health, and physical enjoyment. He has, moreover, not merely shown that in this superior climate of the tropics are already growing various common vegetables of the tropics, but he has further announced the flourishing condition of the tenderest, and yet most productive plants of the torrid zone—the banana plant and the cocoa-palm—which are universally pronounced to be the greatest blessings of Providence to man. And it may, hence, be considered experimentally demonstrated that it is practicable to cultivate all tropical productions in the soil of the southern portion of the peninsula of East Florida.

The *necessity* of cultivating tropical productions for home consumption, is shown by the facts, that the *voluntary labor* of the many millions of the *colored races*, spread over the extremely great surface of the whole torrid zone, does *not* create scarcely any *cultivated* tropical productions for extra-tropical consumption; that the *forced labor* of the few millions of the *black race*, on an extremely small surface of the West India islands, *does* create nearly all the cultivated staples for exportation; and that the forced labor of this black race, with its essential auxiliaries, the skill and capital of the white race, is becoming greatly reduced by the recent emancipating act of the British Parliament.

According to Crawford, the friend and author of "Sugar without Slavery," the free labor of all the natives in the immense belt of the world between 30° north and 20° south latitude, supplies an annual exportation of about 61,500 tons of sugar; a quantity which is not equal to the biennial crop of the slave labor of the few negroes in a little district of Louisiana! Indeed, the greatly superior productiveness of the forced labor of the *colored* natives in *hot* climates, over the voluntary labor of those races in those climates, is doubted only by distant theorists, on the false data obtained from the voluntary labor of the *white* natives of *cold* climates, and from the unphilosophical supposition of the equality or sameness of the different species of mankind. Yet, while this undeniable fact unequivocally shows the relative advantage of employing our existing slaves in the cultivation of tropical staples, it is not cited to prove either the positive propriety or the political expediency of the perpetual continuance of our negro slavery. On the contrary, it is expressly admitted that the *free labor of the white race* is so much more productive than either the *forced or free labor of the black race*, that on this account alone it will in time become desirable to transfer all the colored species to their original Africa,

and to avail ourselves, even in tropical agriculture, of the voluntary labor of our white citizens alone.

As, then, the withdrawal of European skill, capital, and force, from the negro labor of the neighboring portions of the torrid zone, will diminish so greatly the agricultural production of tropical staples for exportation, it has become absolutely *necessary* to employ American skill, capital, and force, on the negro labor of certain portions of our own territory, to create an equivalent supply of cultivated tropical products for the home consumption of the United States.

The *profitableness* of cultivating tropical staples for the foreign market, may be shown with the facts of the immense superiority of our people and of our institutions over those of the torrid zone. Our population is composed of the best varieties of the best species of the human genus, combining all the moral and intellectual improvement of the most civilized nations of Europe. Our Government is the best in the world, because it is the Government of a most moral, industrious, enlightened, and enterprising people. On the contrary, the best colored species of the torrid zone are inferior to the worst varieties of the white species of the temperate zone, in the capacities as well as in the desires, of improving their individual and social condition. Their varied *mis*-governments are the natural results of an indolent, ignorant, immoral, imbecile, and, consequently, poor population. Possessing very few personal desires and very little political protection, scarcely any skill and rarely any capital, however abundant may be the free laborers, and however cheap the free labor, their agricultural products must continue to be scanty and dear. Even in the nominal republics of tropical America, the agriculture of their Indian citizens very rarely affords an adequate supply for their limited domestic market, or even for their scanty personal consumption alone; and the future unproductiveness of the free negro subjects of the British islands, may be inferred from the actual desolation of St. Domingo. Our only rivals, then, in the cultivation of tropical productions for the foreign market, will be the colonies in which slave labor may remain combined with European skill and capital. Of these, the most formidable is the island of Cuba; and yet, her population and Government are greatly inferior to those of the United States for prosperous agriculture. The Spanish variety of the white species of mankind is notorious for the numerous defects of the national character, institutions, and even religion of the individuals who compose it, on both sides of the Atlantic ocean. The disadvantages for profitable production common to all colonial establishments hence increase, both in number and weight, in a Spanish colony. The innumerable taxations of most Catholic despotism, on the time and money of its subjects, rival, in abusive oppression, the numerous exactions of most Catholic superstition on the purse and pursuits of its professors. But independently of every other consideration, the exemption of the American planter from the heavy duties paid by colonial planters on the extra-tropical productions of the United States, consumed by their laborers, will enable the former to furnish tropical productions much cheaper for the European market. Even under the disadvantages of soil and climate in our Atlantic Southern States, their actual cultivated productions of the tropics, their rice, tobacco, and cotton, are profitably exported to every portion of the torrid zone itself, in spite of heavy duties and prohibitory laws; and it may be confi

dently predicted, that within five years, even the sugar of Louisiana will be smuggled into every port of Spanish America.

The *desirableness*, in other respects, of cultivating tropical productions to promote the peace and prosperity of the Union, may be shown by a reference to the hostile policy of the Governments of the torrid zone ; to the present agricultural distress of the Southern portion of our old Atlantic States ; to the future probability of employing the free labor of our white citizens in the agriculture of the warmest sections of the confederation ; to additional considerations derived from the climate and position of south Florida ; and to our moral obligations to improve the condition of our country.

The actual condition of the West India trade illustrates not merely the disadvantages of foreign legislation to our merchants and mariners, but also its still greater injury to our farmers and other creators of domestic products for the tropical markets ; as any diminution of consumption in foreign ports not only diminishes the price of the small excess created for exportation, but also of the immense amount produced for home consumption. The fact that the fluctuations in foreign demand cause the ruinous fluctuations in domestic value, is alone an argument for substituting a domestic market ; and this substitution has, moreover, become an absolutely necessary measure of self-defence against the hostile laws of the Governments of the torrid zone. Nearly all our most important products, both of agriculture and the arts, are either loaded with excessive duties or entirely prohibited in tropical ports. Even our neighboring republics of Spanish America will not admit our Northern wheat or Southern rice, unless when compelled by famine ; nor our greatest staples of tobacco and cotton, under any circumstances whatever. As tropical Mexico refuses to take in exchange our corn and our rice, our tobacco and our cotton, we are, therefore, virtually compelled to cultivate her vanilla and her jalap, and her cochineal cactus, and above all the *foliaceous fibres* of her Henequen Agaves. As tropical Cuba refuses reciprocity to our vessels engaged in transporting her sugar and coffee to our own ports, we must cultivate enough of both staples to freight them more profitably in the coasting trade. But even under the most favorable legislation of tropical countries—a perfect and perpetual free trade—our landed and shipping interests may be both more profitably employed in domestic commerce, with the producers of tropical staples in our own territory. It has already been proved that even our slaves can create cultivated products more abundantly, and much cheaper, than either the freemen or slaves of the torrid zone. It is also equally certain, the standard of comfortable subsistence being so much higher in the United States, that even our slaves consume a much greater quantity of extra-tropical products. Hence, a reciprocal augmentation of supply and demand will form a mutually more profitable trade between the colder and warmer divisions of the Union.

The *agricultural distress* of the *steril* districts of the *old* States (or Northern and Southern Atlantic States) is principally caused by the cultivation of their common staples in the *fertile* districts of the *new* States, (or Western and Southwestern States ;) and the only agricultural remedy for this distress will be found in the cultivation of such new staples *as are equivalents to adding fertility to barren soils*.

It is true that the farmers of the cold Northern Atlantic States cannot well compensate themselves for the superior productiveness of the Western

States in corn and wheat, by cultivating the vine and the mulberry, and that, hence, many are forced to become manufacturers and mariners; but, it is very certain that the planters of the warm Southern Atlantic States can more than compensate themselves for the superior productiveness of the Southwestern States in rice, tobacco, and cotton, by cultivating the cassave *Jatropha*, the cochineal Cactus, and the henequen Agave; and that the sugar palm, on the poorest soils of Georgia, will be more profitable than the sugar cane on the richest loams of Louisiana. As we possess all the soils and climate, with the best people and institutions, of the world, we have neither the necessity nor the desire, nor the power of European agriculturists, to force the production of similar plants in inferior climates and on inferior soils. On the contrary, an American cultivator must select the naturally most productive soil and climate for a given plant, or the naturally most productive plant for a given climate and soil. Hitherto our agriculturists have preferred changing the place of location to varying the object of cultivation; and hence, the fertile valley of the Ohio and Mississippi furnishes the cheapest and most abundant supply of our present staples, both for the domestic and foreign market. Although the only formidable rivals of our Western and Southwestern cultivators *are themselves*, they have already reached the extreme of over-production for foreign consumption. Our Southern planters, on their inferior soils, cannot, hence, any longer continue the profitable production of similar staples; and, by augmenting the number and capital of Southwestern planters, they only injure the latter without benefiting themselves. They must, therefore, seek *new staples* of cultivation in the *naturally most productive plants for their reputed barren soils*. Rich and poor, fertile and steril, are only *relative epithets* in their application to agriculture; and hence, the poorest soils for rice and cotton may be the richest soils for cassave and henequen, and the most steril soils for the tobacco plant and the sugar cane may be the most fertile soils for the cochineal cactus and the sugar palm. "Palm sugar (not cane sugar) supplies the great consumption of the people of the East Indies, in the poorer and more mountainous countries"—"as the palms are the produce of poor soils, and the labor is so small and the quantity of saccharine matter from them so great, that palm sugar is produced at about *half the cost* of cane sugar, of the same degree of purity, that is, for something less than one penny per pound."

Our present tropical staples require a costly, troublesome cultivation; demand a thick vegetable mould; and impoverish the richest soils in which they are planted.

But the future tropical staples of the South will need only a cheap, simple cultivation, will content themselves with bare sandy earth, and will actually enrich the poorest surfaces on which they spontaneously grow. And as our tropical rice, tobacco, and cotton, on equal soils, are absolutely more productive than in their native climates, we may confidently anticipate that our Southern States will enjoy an equal superiority in the culture of tropical cassave, cochineal, and henequen.

Reciprocal prosperity being thus restored, our Southern brethren will cease to calculate the value of the Union.

The possibility of employing the voluntary labor of our white citizens in tropical agriculture, becomes especially important from the consideration that the United States embrace the only portion of the world in which the best laborers and the best institutions can be combined in the cultivation of tropical productions.

The neighboring miscalled republics contain four times as many Indian as white citizens. The latter are the least productive variety of the white race; and their Governments are mere military anarchies. The neighboring distracted colonies contain a majority of negroes, who, when freed, will expel the whites; and thenceforward, like their Haytian predecessors, they will be productive alone in the propagation of their species. Tropical Asia and Africa cannot endure white laborers nor free institutions; and Europe has not any tropical climate into which her white laborers can extend. But our Southern States contain already a respectable number of white laborers; and in Florida they will probably outnumber the negro laborers. The slave States, in their own time and manner, will eventually emancipate and transport all their colored laborers; and we shall then present to the world the only possible example of tropical staples created by the most productive species of mankind, under the most favorable form of government on earth.

The additional considerations derived from the climate and position of south Florida, embrace the retention within our borders of those fellow-citizens who annually leave it to locate themselves or to perish in foreign countries. Texas and Cuba are constantly attracting our agriculturists, who soon sorrow for the happy institutions of their fatherland, and who will return when the existence of a superior tropical climate in southern Florida shall become generally known.

The south of France and Italy have hitherto invited our invalids to perish in the great vicissitudes of their changeable climates, but hereafter they will seek for health in the unrivaled uniformity of temperature, and advantages of position, presented by the tropical extremity of our peninsula.

Our moral obligations to improve the condition of our country, are based on the unparalleled combination of advantages with which it has been favored by Providence. With the most favorable form of government, and the most productive varieties of the best species of the human race, we have all the soils and climates of the earth, and the consequent ability to cultivate most profitably all the most valuable varieties of the best species of the vegetable race. It hence becomes our duty to combine within our territory the creation of the greatest possible amount and variety of cultivated vegetable products for the physical enjoyment, not merely of our own citizens, but also of the inhabitants of all extra-tropical countries, and probably even of the natives of the torrid zone itself. It has been demonstrated, that with a natural equality of soil in even our extra-tropical climates, our slave labor can create cultivated tropical products much more abundantly and cheaply than either the free or slave labor of the colored natives of inter-tropical countries; that many articles of tropical culture, instead of deteriorating, become more productive beyond their native zone; that we may ultimately apply the still more productive free labor of our white citizens to the cultivation of tropical staples; and that such laborers, under such institutions, cannot be devoted to tropical agriculture in any other part of the world. The great equatorial current of the ocean, after cutting off New Holland from Asia, wearing its way round southern Africa, and being reflected by tropical America, brings to our shores, under the name of the Gulf stream, the accumulated heat of the torrid zone, to encourage our cultivation of the valuable vegetables of that unproducing belt of the globe. The white population on its borders will soon be forced to embark on its bosom for the United States. Once entirely abandoned

by the skill and capital of the white species, the colored species will not furnish an adequate quantity of even *uncultivated* products for extra-tropical consumption. Even logwood, mahogany, and other wild materials for the arts, are diminishing every day. The Peruvian bark, sarsaparilla, and other spontaneous medicines, are also vanishing, and noxious substitutes are exported to kill, instead of cure, our fellow-citizens. If, therefore, we do not *speedily* naturalize *all* useful tropical plants in tropical Florida, they will soon disappear from the surface of the world.

I have the honor to be, sir, your obedient servant,

HENRY PERRINE.

CONSULATE U. S. A., CAMPEACHY,

February 20, 1834.

SIR: As an appendix to his communication of the 1st instant, the subscriber avails himself of the only statistical data in his power to *demonstrate* the greatly superior productiveness of slave labor in the United States over slave labor in the West Indies.

British West India colonies, 692,700 slaves, 427,392,000 pounds of sugar, and 19,769,500 pounds of coffee exported.

Spanish island of Cuba, 286,942 slaves, 162,703,425 pounds of sugar, and 42,971,625 pounds of coffee exported.

Louisiana, 109,631 slaves, 70,000,000 pounds of sugar, and 72,000,000 pounds of cotton exported.

Now, admitting for a moment that the culture of cotton is merely equal to the culture of sugar and coffee, as 109,631 slaves produce 142 millions of pounds of sugar and cotton in Louisiana, in the same proportion, 692,700 slaves should produce 897 millions of pounds of sugar and coffee in the British West India islands: and in the same manner 286,942 slaves should produce 371 millions of pounds of sugar and coffee in Cuba. But the former do produce only 447 millions, and the latter only 205 millions; together 692 millions, instead of the 1,268 millions which they should produce in proportion to Louisiana. But the truth is, that the relative value of labor of the production of cotton is at least fifty per cent. more than the value or labor of the production either of sugar or coffee; and hence, the combined 979,642 slaves of British West India islands and of Cuba, should yield 1,590 millions, instead of 672 millions of sugar and coffee, every year, for exportation; or, in other words, with an equal number of slaves Louisiana would supply the consumption of the world!

To obtain the details of the relative productiveness of a single negro, the following estimates are presented of a sugar plantation in Louisiana, and of a sugar plantation in Cuba, each assumed to yield annually 400,000 pounds of sugar.

The first are contained in the report of the agricultural committee of Baton Rouge to the Secretary of the Treasury against the reduction of duties on imported sugar, and must hence be presumed to present the most unfavorable aspect of the cultivation of sugar in Louisiana. The second is taken from pages 108-9 of the Statistical History of Cuba, by

Dr. Ramon de la Sagra, who presents the most favorable aspect of the cultivation, in general, of the staples of that island. The first diminishes the average product of an acre, in Louisiana, to 1,000 pounds of sugar; the second exaggerates the average product of an acre, in Cuba, to 2,088 pounds of sugar; although he had previously admitted that Humboldt was correct in limiting it to 1,116 pounds the acre, or 1,500 arrobas the caballeria.

The Louisiana plantation is stated 1,200 acres = \$50,000; improvements = \$50,000; negroes 80, at \$600 each, = \$48,000; total 148,000 dollars.

The Cuba plantation is allowed only 30 caballerias, or 981 acres, = \$54,000; improvements = \$65,490; negroes, 90, at \$400 each, = \$36,000; total 155,490 dollars.

Of the Louisiana plantation, *one-third*, or 400 acres, is cultivated; giving to each negro five acres, and 5,000 pounds product in sugar.

Of the Cuba plantation, *one-sixth*, or $196\frac{2}{3}$ acres, is cultivated; giving to each negro $2\frac{1}{3}$ acres, and $4,444\frac{2}{3}$ pounds product in sugar, i. e. 555 $\frac{1}{3}$ pounds *less*.

The proportion of the annual expenses of the whole plantation is, for the negro in Louisiana, only 105 dollars; while for the negro in Cuba in ascends to $151\frac{4}{5}$ dollars; i. e. $46\frac{4}{5}$ dollars *more*.

Hence, although the slave in Cuba may cost 50 per cent. *less*, and the ground he works may produce upwards of 100 per cent. *more*, the slave in Louisiana, both positively in sugar and negatively in money, may gain for his master upwards of 100 per cent. *more*!

Without reference to the *price* of the sugar, or of the coffee, or of the cotton, it may, in the same way, be shown that on *inferior soils* even our slave labor will create much greater quantities at much less expense! But when we admit the soil and climate to be *equally* productive, how infinitely superior are the products of American *skill*, capital, and *economy*, combined; and when we still further contemplate the *greater* productiveness of most articles of tropical culture, acclimated within our territory, we may safely anticipate that, within twenty years, the southernmost sections of our Union will yield every tropical staple for the consumption of even the torrid zone itself.

I have the honor to be, very respectfully, sir, your humble and obedient servant,

HENRY PERRINE.

To the Hon. LOUIS McLANE,

Secretary of State of the U. S. A., Washington City.

Obstacles to the collection of information and plants in and from Mexico.

By H. Perrine, M. D. To S. Fleet, editor New York Farmer.

CONSULATE UNITED STATES OF AMERICA,

Campeachy, June 7, 1834.

DEAR SIR: I am just convalescing from a nearly fatal attack of inflammation and obstruction of the intestines, on the 26th ultimo, resulting from the corporeal exertion and mental agitation requisite to collect and trans-

mit a considerable quantity of perennial plants and stingless bees to New Orleans. In my letter of the 1st of January, 1830, to the Secretary of the Treasury, I observed that, "in promoting the objects of the Department, difficulties inconceivable, even among the scattered inhabitants of our Western frontiers, must necessarily render the progress of an inquirer very slow." In relation to physical obstacles, I remarked that, "for the protection of this country from foreign invasion, the principal reliance is placed on its briery and thorny underwood, swarming with ticks and musquitoes." "But," I added, "the character of this people is more impenetrable than the covering of their soil. The Spanish jealousy of any foreign observer is augmented by Creole ignorance, and where despotic intolerance does not fetter him, affected friendship misleads him by false intelligence." How much time, labor, and expense I absolutely wasted before I became thoroughly convinced that it was indispensably necessary for me to depend only on my own eyes and my own hands in the acquisition of intelligence or the collection of vegetables! How often did I falsely attribute to the want of roads and carriages the non-arrival at this port of plants that were never pulled, and of seeds that were never collected in the interior! And how reluctantly have I at last become convinced that the most intelligent and apparently liberal personages of the country—men who acknowledged themselves indebted to me for their lives, and who would be ashamed to make any direct open opposition to my pursuits—have nevertheless deceived me by false promises every year since my arrival in 1827! Would you believe it possible, that notwithstanding my extensive popularity and intimate relations, I have never been able to obtain, through the hands of any individual, one single seed of the logwood tree!! The few that you saw in New York, I myself personally collected, after offering a doubloon, (\$16,) in vain for a single ounce, to the poorest Indians. The late Mr. Thibaud, of New York, was walking with me in the outskirts of the capital of Tabasco, during May, 1831, when we arrived at the hut of an Indian family, whose members appeared grateful to me both for professional and personal charity. A logwood tree grew before the door, alongside of the gully, called a creek during the rainy season. Wishing to exhibit to Mr. Thibaud the strangely jealous character of these people, I asked the father of the family if he wished to make me a slight return for the many favors conferred on him and his family. He eagerly replied that he would show his gratitude in any way that pleased God. I then said, "Strip off a small bag of these pods containing the logwood seed, and accompany us with it to my house." He was so disconcerted at the request, that at first he knew not what to say; but, finally, approaching me, he whispered, "I will bring the bag of seeds to you after dark, at midnight." "Speak out," said I; "why not pluck and carry them immediately?" "Well, sir, I must confess I am afraid to be seen carrying any seeds or plants to you. Our big men have told us that you are robbing the country of all its valuable plants, and that if we don't take care, there will not remain a single stick of logwood in our swamps for us to cut and maintain our families." I turned round to Thibaud, and observed, "You perceive that they imagine the acquisition of a single seed or plant will give to me the power of Aladdin's ring or lamp, to carry off all their logwood swamps, mahogany forests, and cacao plantations, in the twinkling of an eye. That Indian will not bring me the seeds; and should his superiors ever offer me a single teaspoonful, I

should be convinced, by that fact alone, that they were deprived of the vegetating properties by boiling, as was done with a small parcel carried to Havana."

I should have been greatly obliged to my Mexican friends had they told me at once, seven years ago, that they either could not or would not aid me ; but, on the contrary, all the leading members of society, the civil officers of the town, and the wealthy planters of the country, very freely promised me to collect every thing I desired at its proper season of maturity. But that season never arrived. When they or their servants arrived, the seeds were not ripe enough to be collected, or had fallen from the trees, and been eaten up by animals, or carried away by rains ; or that, on account of the excessive dryness or wetness of the season, the fruits had not matured, &c. As for the living plants, forty-nine out of fifty that finally arrived in this city, are so mutilated, bruised, and dried or rotten, that they cannot be preserved even by my own personal care in transplanting them here. If I trust them to others, they are sure to perish. I could never obtain a living vanilla vine from Tabasco, until a year and a half ago, when I availed myself of the secret policy of making it a regular mercantile commission between two old resident foreign merchants, married with females of the country. The Campeachy merchant ordered a box of cuttings of the Tabasco merchant, and I distributed one by one, at least thirty cuttings to all the families who were noted for having a few plants of ornament or utility in their yards or gardens ; but none exists at this day, except one under the care of the aforesaid merchant, and another under my immediate care, of which I sent one new cutting to Cape Florida, nearly a year since, and another to New Orleans, about twelve days ago. So with regard to the young pita plants of Tabasco and of Goazacoalcos. Of more than a hundred, there is now in Campeachy but one under my care. One ought to be growing at Cape Florida, and five or six at New Orleans, or at least the three which I last sent under the personal inspection of an American passenger.

After having conquered every previous difficulty, even the task of carrying the plants from my own yard to the mole, and thence aboard the vessel, is a severe trial both to my health and temper. My last remittance to New Orleans, in the Mexican schooner *Francisca*, consisted of upwards of 50 medium-sized plants of the two cultivated varieties of the Sisal hemp ; upwards of 200 leaves, or joints, of two varieties of the cochineal cactus ; 20 hives of stingless bees ; 2 full-grown plants of the eatable pinuela, or bromelia penguin ; 100 joints of the delicious pitahaya, or strawberry pear, of a cactus triangularis ; a number of joints of other pleasant-fruited species of cactus, &c., besides three young pita plants, and a vanilla plant.

You are aware that since the cholera, a year ago, I have not enjoyed at any one time more than ten or twelve days of health or strength sufficient to be in the street. Nevertheless, on the 26th ultimo, it was requisite that I should labor personally in the sun to prepare the plants, &c. in the yard ; to walk along the carts which carried them to the mole ; and to see them safe in the canoes to carry them aboard ; and to suffer the insults of the populace, who cursed me for robbing their plants, and the authorities for permitting me to collect and carry them away. The carmen and canoemen exacted double and treble prices ; injured the plants as much as possible on the route ; treated me with the most insolent conversation ; and contrived it so, that when the cart arrived the canoe would

not be there, and oblige me to pay them for carrying back the plants to my boarding-house near the gate, and thence back again to the mole, when the canoe should be ready to carry them aboard.

Hence, you perceive that, in addition to paying exorbitant prices for each cart-load, I was obliged to pay the same three times over for the same load, beside the trouble of unloading and reloading. If the load had been disembarked on the wharf, when the canoe was not there, I should have been obliged to stay alongside of it the remainder of the day and all night, exposed to insults and violence, or left the plants to certain destruction. As a young Mr. Gookins, from New Hampshire, had engaged his passage in the Mexican schooner Francisco, I was so extremely anxious to ensure his protection of the plants from the hostility of the Mexican captain and crew during their passage, that I over-exerted myself both in body and mind to such a degree as to be in imminent danger of death during the night. As this amiable young man passed both the day and the night at my side, and the next day took from my feeble lips the directions relative to the distribution of the plants and bees, he will be able to give you the details of my sufferings during only twenty-four hours of the many years that I have passed in behalf of the domestication of tropical plants.

You will recollect the Sr. Leal, of Yucatan, to whom I gave you a letter of introduction, and to whose care I intrusted a large perspective view of this port and city, to be presented to our venerable President. Would you believe that he brought advices from a Spanish merchant in New York, to the Governor of this State, to beware of permitting my embarking any more hemp agaves, as the cultivation of them in Florida would be prejudicial to the planters and State of Yucatan. That he did communicate that message, I have the authority of the Vice Governor himself, who was present during his conversation with the Governor. Mr. Leal I forgive, because he has since sent me some seeds of a species of cotton, which he affirms to be a climbing plant, cultivated in the interior of this peninsula; but the Spanish merchant of your city must be reminded that he has acted unworthily the title of American citizen, which he bears, and of the prosperity which, under its protection, he enjoys, however characteristic of the degraded blood in his veins.

With the foregoing circumstances in view, you will see that it is impossible for any individual to obtain an entire cargo of living plants from Yucatan, unless aided by a vessel of war, expressly sent by the American Government for that purpose. You know that the exportation of the cochineal insect is expressly prohibited by the Mexican Government itself; and, although there is no law which prohibits the exportation of a cargo of hemp agaves, or of the cochineal cactus, yet I have no doubt that any individual attempt would be effectually opposed both by the people and the authorities.

So extremely absurd is the ignorant jealousy of the people in general, that if a foreigner manifests a desire to collect the most worthless weed, they imagine it at the moment to be worth a mine of gold. The first reply to the most simple question about the most ordinary plant, is, "How much is it worth in your country?" And the more you endeavor to convince them that it has no pecuniary value, the more strongly they persuade themselves that it will afford a fortune to its possessor. Like the dog in the manger, however, they will neither eat themselves nor permit others to eat. Having heard that the collectors of antiquities had acquired

riches by their exhibitions in Europe, the Mexican Congress passed a law prohibiting their exportation ; and hence the common people reason, that if old stones are so valuable, new weeds must be worth a great deal of money.

But, independently of every other consideration, their hereditary hostility to strangers, cherished by their own authorities, is sufficient to cause them to throw every obstacle into the way of all inquiring foreigners.

Of the despotism which the civil authorities exercise, even on their own countrymen, you may infer from the fact that, about six weeks since, a gentleman was put in the prison by a vulgar alcalde of the present year, for not having taken off his hat when passing at thirty yards distance in the street. The conduct of these authorities resembles that of negroes when made overseers of their brother slaves. In the West-India islands and in our Southern States, you will find that the slaves infinitely prefer a white to a black overseer, as the latter is much more overbearing and cruel in his treatment. The Greek tax-gatherer of his fellow Greeks, under the Turkish Government, and the Hindoo exciseman, among his fellow Hindoos, under the British Government, and all the authorities under the Spanish American Governments, are equally proofs of the despotism universally exercised by fellow slaves when invested with even temporary power over their brethren. I have repeatedly stated the fact, that so far as my office from affording respect or protection to my person, that I am indebted to my profession alone for my partial exemption from insult and outrage. But any foreigner who undertakes any pecuniary enterprise in this country, may rest assured that he will never be able to carry it into complete execution. If his property is not destroyed, and his person not imprisoned by the nearest barefooted alcalde, or despotic sub-delegate, the common council of the city will pass an especial ordinance to his injury ; and if that be not sufficient to break up his establishment, the legislature of the State will decree an especial law against the branch of industry in which he is engaged. A Doctor Baldwin, established a saw-mill, moved by animal power, on the banks of the Goazacoalcos, and was beginning to reap the rewards of his capital and industry thus employed, when the legislature of Vera Cruz imposed a tax on the trees he cut, and on the boards he sawed, amounting to a prohibition ; and, after spending more money than he ever gained, in ineffectual attempts to obtain justice, he abandoned the saw-mill in despair. Hundreds of similar examples may be cited throughout the Mexican States.

But what can a foreigner expect when he sees the manner in which they treat even such of their own citizens as engage in any industry or enterprise likely to augment their own fortunes and the prosperity of the States in which they reside ? The late P. Guzman, of Merida, was the most meritorious citizen of Yucatan, in our use of the epithet. He introduced the few important manufactures that existed in this peninsula ; such as the tanning of hides, the making of soap, &c. He also projected the extraction of the coloring matter of logwood for exportation ; which renders valuable the trees in the interior, too distant from the shore to pay the expenses of transportation. As the machinery for shipping the wood was costly, and the success of the extract in the foreign market still problematical, he begged and obtained, in 1828, an exclusive privilege of only five years from the legislature of this State ; but, as soon as he got the

manufactory into complete operation, at a great expense, in 1829, the same legislature repealed the law, alleging that the use of machinery was prejudicial to the poor carriers of logwood to the shore !

Very respectfully,

H. PERRINE.

Extracts of letters from Charles Howe, inspector and postmaster at Indian Key, tropical Florida, to Doctor Henry Perrine, at Washington City.

"September 2, 1837.—I have planted a few of almost every kind of your seeds, or, at least, I have got to No. 156 in boxes, including the few tubs we planted before you left, (5th August;) and in some of the boxes I have planted three different kinds, some two, and others only one. I conclude, however, that there are now at least two hundred in number planted, and several of the first have come up very finely. On opening one of your trunks a few moments ago, to look for the books you requested me to send Dr. Leitner, I found more seeds, which I shall examine more particularly very soon."

"November 1.—About one-third of your seeds have come up, and look finely—say between fifty and sixty different kinds; and others, I have no doubt, will make their appearance soon. My front yard, you must know, begins to look quite respectable, with 168 boxes placed in rows, containing such a variety of choice tropical plants. It excites the attention of almost every body who passes the street."

Extracts of letters from John Dubose, formerly inspector and light-house keeper at Cape Florida, but now at Key West, to Doctor H. Perrine.

"November 1, 1837.—Of those plants and seeds sent by you from Mexico. (1833,) there now remains the Sisal hemp, or Tropical Flax plant, called Peter. I have not seen it since January, 1835. It was planted in a rich soil, and was at that time growing finely; and as it was a dangerous plant to intrude on, owing to the thorns with which the ends of the leaves were armed, the presumption is that the Indians have not interfered with it. The Pulque, or substitute for the Mexican beer, was growing in great perfection, having put out a great many suckers, which could, by this time, have been multiplied to any extent; and as soon as the Indians give us permission to return to our homes, I expect to find more plants than will be wanted. As far as my recollection extends, there are two other kinds of Aloes growing and doing well; one of which appeared to be very fruitful, judging from the great number of sprouts or suckers springing up around the original plant. The Turmeric was also growing. The Cochineal Cactus, or large oval prickly pear, as well as the three-cornered prickly pear, (called by you the strawberry pear,) were also growing when I last saw them. You will also find the Arnotta plant, African Date, Paper Mulberry, Multicaulis, and a plant like the Tanyar."

N. B. *Remarks by H. P.*—The plants called Aloes by Mr. Dubose are species of Agave. The species most like the true Aloe, in the *succulency* of its *leaves*, is the celebrated Pulque Agave. The one with thorns only at the *end* of the leaves is the variety of the Agave Sisalana, called Yash-quí, and pronounced Yash-kée. The English spelling of Peter, or Petre, is an imitation of the Spanish sound of the word Pita. The species of Agave and of Cactus should have been planted in arid, poor soils. The same remark applies to the Date Palm, and to many other plants introduced by me into tropical Florida. H. P.

Continuation of the letter of Mr. Dubose.—"My son, John Dubose, took up, in 1832, (under the pre-emption laws of the United States,) 160 acres of land, called, in that country, the hunting ground. He has improved it, and planted there until January, 1835, at which time the settlers all deserted their homes. This land is distant from the Cape Florida light-house, southwest, twelve miles. This will account to you why Mr. Howe did not see at the cape any of your plants. As an experiment, I planted the paper Mulberry and *Morus multicaulis* at the light-house. The former grew finely, became of some size, and, in the hurricane of 1835, the sea overflowed it to the depth of three feet, and killed it. The *Multicaulis* bore fruit in October, 1835; and I saw it and three more small trees of the same kind, on my late visit to Cape Florida light, on 16th August, 1837. My son (John D.) took under his charge some of your plants, viz: Sisal Hemp, the three species of Aloes, or Pulque, the Arnotto plants, the Date, the paper Mulberry, and Turmeric, and planted them at the hunting-ground. I was there in May, 1835; they were growing well. Since then, that place has been in possession of the Indians. We have every reason to suppose they are still there. I sincerely hope that Congress will properly appreciate your exertions."

KEY WEST, December 27, 1837.

DEAR SIR: By the arrival of the Charleston mail, on the 23d instant, I received yours of the 3d instant. With respect to the inquiry you make as to the person who first introduced the *Morus multicaulis* into East Florida, I think I am warranted in the assertion that the plants forwarded to me from New York, (by your order,) in May, 1833, were the *first that had been seen in East Florida*. In August, 1835, I visited St. Augustine, and took some pains to ascertain whether they had received any plants of true *Multicaulis*. A very intelligent gentleman then informed me that he had some plants, and would furnish me with cuttings from them, to be carried to the cape. On examining the plants, I found he was mistaken: they were the White, or Italian Mulberry. He considered them a species of the *Multicaulis*. At the same time, he observed to me that they had not been able to obtain any of the dwarf *Multicaulis*, (as he termed them,) as their introduction into the United States had been of so late a date. The difference between the *Morus multicaulis* and the Italian Mulberry is striking, and can at first view be seen. From this, and from the fact that there had been no others introduced into the more southern part of this Territory, I take it for granted that yours were the first introduced. At the time I received them, I was unacquainted with their nature and value. The eldest one, planted at the Cape Florida light-

house, bore a few mulberries in November, 1835; and one planted in my garden on the main grew so rapidly, that I have often been obliged to cut all the limbs off, say six feet long; and as I did not know that they would grow, they were thrown away. It is near two years since the Indian war compelled me to leave home, and it is not in my power to speak of the present situation of these plants. I take it for granted that they continue to grow. I left at the Cape Florida light-house seven young trees, and at the hunting ground garden twelve others. Had my attention been directed to their increase, there might at this time have been 2,000 young trees. In October, 1835, W. L. Smith, of New York, brought out and planted at the cape about twenty young *Multicaulis* plants; and in December, 1836, Mr. Charles Howe received a few of the plants, which were set out at Indian Key. These plants thrive well in this climate at all seasons; as a proof of which, allow me to state that about the 14th December, 1835, my son, as an experiment, cut off six small limbs, and stuck them in the ground. In twenty days from that time they had taken root, and had a new coat of leaves on them. One great advantage we will always have over our Northern friends, in the cultivation of the *Morus multicaulis*, is the fact that the tree does not cast its leaves through the winter, but is at all times in a situation to afford food for the silkworm. Our winter, so far, has been cold: the thermometer, for a few hours on the 20th, was as low as 54°. Happily for us, it soon raised, and on the 21st, was 88°.

Very respectfully, yours,

JNO. DUBOSE.

H. PERRINE, Esq., *Princeton, N. J.*

N. B. *Remarks by H. P.*—Had Mr. Dubose known the nature of the *Manilla* mulberry, or *Morus multicaulis*, and the best treatment of it in a tropical climate, he might now have multiplied these plants a million fold. Professor Don Ramon de la Sagra, of the royal botanic garden at Havana, received two plants from New York in the fall of 1832, and by repeated subdivision, he obtained upwards of five hundred plants in the spring of 1834, from which he obtained leaves enough to make experiments with the silkworm; which satisfied him that in Cuba, ten crops of cocoons could be obtained in a single year. In Guadeloupe, the French Government sustains an establishment of 40,000 plants of *Morus multicaulis*; and there Dr. Meunier, of the navy, cited by Sagra, obtained ten crops annually during three successive years.

Had Mr. Dubose known the nature, value, or even names, of many other plants and seeds of the tropics, sent by me from Mexico via Havana, New Orleans, and Key West, he would doubtless have preserved and propagated many more. In 1835, the sea conspired with the Indians to destroy my tropical plants, by inundating all the southeastern coast of Florida; yet it is already seen that many valuable plants have survived; and I have no doubt others, not named, are now *propagating themselves* in tropical Florida.

H. P.

KEY WEST, November 25, 1837.

DEAR SIR: Your letter of the 9th. October I duly received, and you have my best wishes for your success in the application you are now making to Congress. That it deserves the favorable consideration of that

body, I do not doubt; for your undertaking, if successful, will eventually prove highly important to the interests of the Union, from the improvement which the peninsula of Florida will derive from the introduction into its soil of the many plants that you are so anxious to propagate. From the inspection of the papers on the subject with which I was favored while you were here, I arrived at the conclusion that many of those plants were admirably adapted to the soil of a considerable portion of the peninsula, and particularly to the soil of the islands, to portions perhaps that will not be susceptible of any other profitable planting. As to the cost of production, and consequent profit to be expected from the cultivation of your plants, you of course are best able to judge. I however, should doubt of your being able to compete with the little expense incurred in their cultivation in their native soil, and the slightly increased value from cost of transportation, most, if not all of the produce of the plants being free from duty. It has been truly said, however, that "he who makes only one spear of grass grow where none grew before, is a benefactor to mankind;" and I, therefore, shall be truly glad to learn that your project is in a fair way to result favorably, though as I have observed, I doubt if you will be the one to profit by that result.

In relation to the conversation had with me as to the cost of clearing an acre of land upon this island, walling it in, and getting it ready for planting, I have only to say, that the sum I then named *without calculation*, I am convinced would be found very near the truth. The lowest price for which a wall of ordinary height can be erected here around an acre of ground, with the stones taken from the land itself, is \$2 per perch (or 16 feet,) and as a square acre takes about 50 perch to surround it, it gives \$100 as the cost of *enclosing* alone, and I have no doubt (and others concur with me in opinion) that another \$100 would be expended in clearing away wood, stumps, &c, before the ground would be in a proper state for the reception of seeds, &c. Of course the greater extent of ground you have to enclose, the less wall you have to the acre, as, for instance, 4 square acres would require only *twice* the quantity of one acre. On the main land you would probably not meet with as many difficulties in the way of preparing the soil, and here you are aware we are peculiarly situated, the price of labor, living, and every thing being excessively high.

You ask after the condition of your stingless bees which you sent to me from Campeachy. I received them, as you are aware, in April, 1836. The seven hives sent were all delivered; though most of the bees had died on the way, one of the hives being entirely without them. The six hives in which the bees remained have been taken good care of, but the number of the bees has not materially increased. The fact of their being *stingless* I have substantiated to my satisfaction. The hive that was unoccupied, contained a small quantity of honey, but not enough to enable me to judge of its quality. It was in a comb, not constructed like that of the common honey bee, but resembling a collection of small bags, something similar, I understand, to the comb of the humble-bee.

I should be pleased to receive copies of the agricultural publications to which you allude, as containing letters upon Key West. I have not met with any of them.

Respectfully, sir, yours,

W. A. WHITEHEAD.

Dr. HENRY PERRINE,
Washington City.

WEATHER ONE YEAR IN TROPICAL FLORIDA.

METEOROLOGICAL REGISTER.

TEMPERATURE AND ATMOSPHERIC PRESSURE,

REGISTERED FROM ADIE'S SYMPLESOMETER,

NOTED AT SUNRISE AND TWO O'CLOCK P. M.

ALSO THE

COURSE AND VELOCITY OF THE WINDS, AND QUANTITY OF RAIN,

AT INDIAN KEY, FLORIDA,

LATITUDE 24° 48" NORTH, LONGITUDE 80° 55" WEST,

DURING THE YEARS 1836 AND 1837.

EXPLANATION OF TERMS.

Clear and pleasant days—Those in which a cloud is not visible above the horizon from sunrise to sunset, in which the weather is not cold nor hot, and with a pleasant breeze.

Fair days—Are also pleasant days; but if there be flying clouds, yet not sufficient to obstruct the sun from shining, and whether the air be calm or windy, it is still termed a fair day.

Cloudy days—Are those when the sun is hidden from view more than half the day.

The velocity of the wind is determined from the following scale: calm, light, pleasant, brisk, fresh, very fresh, a gale.

JANUARY, 1886.

Day of month.	Thermometer.		Barometer.		Winds—morning.		Winds—afternoon.		Character of weather.
	Sunrise.	2 p.m.	Sunrise.	2 p. m.	Course.	Velocity.	Course.	Velocity.	
January 1	64	68	30.06	30.08	North,	-	North,	Brisk,	Clear and pleasant.
2	66	71	30.22	30.14	East,	-	East,	Fresh,	Cloudy.
3	70	75	30.22	30.06	East,	-	East,	Fresh,	Fair.
4	71	75	30.10	29.94	East,	-	East,	Very fresh,	Fair.
5	72	77	29.98	29.87	East-southeast,	-	East-southeast,	Brisk,	Cloudy.
6	74	79	29.94	29.80	East-southeast,	-	East-southeast,	Light,	Cloudy.
7	73	77	29.88	29.80	Southwest,	-	Northwest,	Fresh,	Cloudy; (change wind 5 p. m.)
8	70	72	30.00	29.90	North,	-	Northwest,	Light,	Clear and pleasant.
9	65	67	30.05	30.04	North-northwest,	-	North-northwest,	Light,	Fair.
10	61	64	30.20	30.20	North,	-	North,	Light,	Fair.
11	59	65	30.21	30.10	North,	-	North,	Calm,	Clear and pleasant.
12	61	69	30.18	30.08	North,	-	North,	Light,	Fair.
13	68	71	30.18	30.04	East,	-	East,	Light,	Fair.
14	68	72	30.20	30.18	East,	-	North-east,	Brisk,	Fair.
15	69	74	30.18	29.90	North-east,	-	North-east,	Light,	Fair.
16	67	73	30.12	29.93	North-north-east,	-	East,	Light,	Clear and pleasant.
17	69	76	29.90	29.90	East,	-	Southeast,	Light,	Fair.
18	73	79	29.95	29.82	Southeast,	-	Southwest,	Light,	Fair.
19	73	81	29.92	29.74	South,	-	South,	Fresh,	Fair.
20	73	73	29.94	29.94	West,	-	North-east,	Fresh,	Fair.
21	71	76	30.04	29.90	East,	-	East,	Fresh,	Fair.
22	73	74	29.92	29.88	East,	-	East,	Fresh,	Fair.
23	74	77	29.92	29.90	East,	-	East,	Light,	Clear and pleasant.
24	75	80	29.84	29.84	Southeast,	-	Southeast,	Light,	Clear and pleasant.
25	73	70	29.94	30.02	Northwest,	-	Northwest,	Fresh,	Fair.
26	65	65	30.24	30.18	North-northwest,	-	North-northwest,	Fresh,	Cloudy; (breeze sprung up 6 a.)
27	57	63	30.24	30.14	North,	-	North-northwest,	Brisk,	Clear and pleasant.
28	54	56	30.32	30.30	North,	-	North,	Fresh,	Fair.
29	49	61	30.42	30.24	North,	-	North,	Fresh,	Fair.
30	62	74	30.18	29.92	Southeast,	-	Southeast,	Fresh,	Fair.
31	73	70	29.84	29.86	South,	-	Southwest,	Fresh,	Cloudy and rain. 2.00 inches rain.

FEBRUARY, 1886.

Day of month.	Thermometer.		Barometer.		Winds—morning.		Winds—afternoon.		Character of weather.
	Sunrise.	2 p. m.	Sunrise.	2 p. m.	Course.	Velocity.	Course.	Velocity.	
Feb'y 1	57	62	30.22	30.25	West,	-	Northwest,	Fresh,	Fair.
2	58	61	30.22	30.24	North,	-	Northwest,	Brisk,	Fair.
3	55	56	30.30	30.28	North,	-	North,	Brisk,	Fair.
4	47	55	30.38	30.30	North,	-	North,	Fresh,	Fair.
5	53	62	30.38	30.22	North,	-	North,	Brisk,	Clear and pleasant.
6	56	64	30.32	30.06	North,	-	North,	Brisk,	Fair.
7	64	67	29.68	29.94	North,	-	Northwest,	Brisk,	Cloudy, and light rain.
8	60	62	30.12	30.14	Northwest,	-	North,	Brisk,	Fair.
9	58	68	30.22	30.10	North,	-	North,	Light,	Fair.
10	64	72	30.18	30.08	East,	-	East,	Brisk,	Fair.
11	69	74	30.14	30.08	East,	-	East,	Fresh,	Fair.
12	68	74	30.22	30.08	East,	-	East,	Fresh,	Fair.
13	70	75	30.16	30.08	East,	-	East,	Brisk,	Fair.
14	69	75	30.12	29.96	North,	-	Northwest,	Brisk,	Fair.
15	64	72	30.26	30.08	North,	-	Northwest,	Light,	Clear and pleasant.
16	65	72	30.22	30.04	North,	-	Northwest,	Brisk,	Fair.
17	64	74	30.14	30.00	Northwest,	-	West,	Light,	Fair.
18	66	75	30.04	29.92	North,	-	East,	Light,	Fair.
19	71	76	29.84	29.82	Southwest,	-	East,	Fresh,	Clear and pleasant.
20	67	74	30.00	29.82	Northeast,	-	East,	Light,	Fair.
21	70	74	30.00	29.94	Northwest,	-	East,	Brisk,	Fair.
22	67	73	30.08	29.96	Northeast,	-	East,	Fresh,	Fair.
23	68	78	30.04	29.90	East,	-	Southeast,	Pleasant,	Fair.
24	73	78	29.86	29.80	South,	-	Southwest,	Light,	Fair.
25	74	83	29.92	29.75	Southwest,	-	South,	Light,	Clear and pleasant.
26	75	85	29.82	29.75	Southwest,	-	Southwest,	Pleasant,	Fair.
27	75	83	29.92	29.84	Southeast,	-	Southeast,	Pleasant,	Fair.
28	75	83	30.04	29.90	Southeast,	-	Southeast,	Pleasant,	Fair.
29	76	83	30.00	29.94	Southeast,	-	Southeast,	Fresh,	Fair.

0.64 inches rain.

MARCH, 1896.

Day of month.	Thermometer.		Barometer.		Winds—morning.		Winds—afternoon.		Character of weather.	
	Sunrise.	2 p.m.	Sunrise.	2 p. m.	Course.	Velocity.	Course.	Velocity.		
March 1	76	82	29.90	29.77	Southeast,	-	Southeast,	-	Fresh,	Fair.
2	77	83	29.92	29.80	South,	-	South,	-	Fresh,	Fair.
3	73	78	30.00	29.80	Northeast,	-	Variable,	-	Light,	Cloudy and rain.
4	66	70	30.02	30.00	Northwest,	-	Northwest,	-	Brisk,	Fair.
5	58	68	30.20	30.06	North,	-	North,	-	Calm,	Fair.
6	64	72	30.12	30.06	North,	-	Northeast,	-	Light,	Fair.
7	71	79	29.92	29.66	North,	-	Southwest,	-	Calm,	Fair.
8	76	82	29.68	29.60	South,	-	West,	-	Light,	Fair.
9	75	83	29.76	29.58	South,	-	South,	-	Brisk,	Clear and pleasant.
10	76	82	29.72	29.70	South,	-	North,	-	Fresh,	Cloudy and rain.
11	62	65	30.30	30.24	North,	-	North,	-	Fresh,	Fair.
12	56	63	30.38	30.25	North,	-	Northeast,	-	Very fresh,	Fair.
13	66	74	30.22	30.02	Northeast,	-	East,	-	Fresh,	Fair.
14	72	78	30.12	30.00	East,	-	East,	-	Brisk,	Fair.
15	73	78	30.10	30.00	East,	-	East,	-	Brisk,	Fair.
16	72	77	30.16	29.98	East,	-	East,	-	Fresh,	Fair.
17	73	77	30.10	29.98	East,	-	East,	-	Fresh,	Fair.
18	72	77	30.00	30.00	East,	-	East,	-	Fresh,	Fair.
19	75	80	30.06	29.90	East,	-	East,	-	Brisk,	Fair.
20	74	83	30.02	29.80	Southeast,	-	Northwest,	-	Brisk,	Fair.
21	74	82	29.94	29.80	North,	-	West,	-	Light,	Fair.
22	74	77	29.92	29.92	North,	-	North,	-	Fresh,	Clear and pleasant.
23	67	72	30.12	30.04	North,	-	Northeast,	-	Very fresh,	Cloudy.
24	69	74	30.04	29.86	Northeast,	-	East,	-	Very fresh,	Cloudy and rain.
25	71	70	29.84	30.02	Northwest,	-	Northwest,	-	Very fresh,	Cloudy and rain.
26	62	68	30.24	30.18	North,	-	North,	-	Very fresh,	Fair.
27	65	69	30.24	30.12	Northeast,	-	Northeast,	-	Very fresh,	Fair.
28	68	73	30.16	30.06	Northeast,	-	Northeast,	-	Very fresh,	Fair.
29	70	74	30.10	30.06	East,	-	East,	-	Fresh,	Fair.
30	72	76	30.10	30.04	East,	-	East,	-	Brisk,	Fair.
31	72	77	30.02	30.04	East,	-	East,	-	Fresh,	Fair. 2.50 inches rain.

APRIL, 1886.

Day of month.	Thermometer.		Barometer.		Winds—morning.		Winds—afternoon.		Character of weather.
	Sunrise.	2 p. m.	Sunrise.	2 p. m.	Course.	Velocity.	Course.	Velocity.	
April 1	72	78	30.02	29.90	East,	Pleasant,	East,	Brisk,	Fair.
2	73	81	29.90	29.80	Southeast,	Light,	Southeast,	Light,	Clear and pleasant.
3	75	89	29.86	29.78	South,	Brisk,	South,	Pleasant,	Fair.
4	76	82	29.74	29.63	Southwest,	Fresh,	West,	Fresh,	Fair.
5	74	80	29.86	29.70	Northwest,	Pleasant,	West,	Fresh,	Fair.
6	70	75	29.96	29.86	North,	Pleasant,	East,	Fresh,	Fair.
7	71	76	30.02	30.00	Northeast,	Fresh,	Northeast,	Very fresh,	Fair.
8	71	75	30.16	30.10	Northeast,	Very fresh,	Northeast,	Very fresh,	Fair.
9	71	74	30.16	30.00	East-northeast,	Very fresh,	East-northeast,	Very fresh,	Fair.
10	71	75	30.00	29.84	North,	Pleasant,	North,	Fresh,	Fair.
11	71	80	29.90	29.70	North,	Pleasant,	East,	Fresh,	Fair.
12	73	79	29.82	29.80	East,	Fresh,	East,	Fresh,	Fair.
13	74	84	29.87	29.85	East,	Pleasant,	East,	Light,	Fair.
14	76	85	29.86	29.72	Southeast,	Light,	South,	Light,	Clear and pleasant.
15	77	86	29.82	29.76	South,	Light,	South,	Calm,	Clear and pleasant.
16	77	86	29.82	29.74	South,	Light,	South,	Brisk,	Clear and pleasant.
17	77	86	29.80	29.82	South,	Fresh,	South,	Brisk,	Fair.
18	79	86	29.82	29.80	South,	Brisk,	Southeast,	Brisk,	Fair.
19	79	86	29.86	29.76	Southeast,	Brisk,	Southeast,	Brisk,	Fair.
20	79	85	29.88	29.78	Southeast,	Fresh,	East,	Fresh,	Fair.
21	78	85	29.98	29.90	East,	Fresh,	East,	Brisk,	Fair.
22	77	84	29.96	29.82	East,	Pleasant,	East,	Pleasant,	Fair.
23	77	84	29.98	29.90	East,	Pleasant,	East,	Pleasant,	Fair.
24	76	77	30.04	30.02	Northeast,	Very fresh,	Northeast,	Fresh,	Cloudy and rain.
25	76	77	30.02	30.08	Northeast,	Very fresh,	Northeast,	Fresh,	Cloudy and rain.
26	75	78	30.06	30.10	Northeast,	Very fresh,	Northeast,	Fresh,	Fair.
27	75	78	30.02	30.00	East-northeast,	Fresh,	East-northeast,	Fresh,	Fair.
28	76	79	30.00	29.92	East-northeast,	Very fresh,	East-northeast,	Very fresh,	Cloudy and rain.
29	76	79	29.95	29.87	East,	Very fresh,	East,	Very fresh,	Cloudy and rain.
30	77	81	29.90	29.84	East,	Fresh,	Southeast,	Fresh,	Cloudy and rain.

MAY, 1886.

Day of month.	Thermometer.		Barometer.		Winds—morning.		Winds—afternoon.		Character of weather.
	Sunrise.	2 p. m.	Sunrise.	2 p. m.	Course.	Velocity.	Course.	Velocity.	
May 1	76	80	29.96	29.92	Southeast,	Briak,	East,	Fresh,	Cloudy and rain.
2	77	80	29.88	29.90	East,	Fresh,	East,	Fresh,	Fair.
3	77	80	29.90	29.90	East,	Fresh,	East,	Fresh,	Fair.
4	78	82	29.82	29.90	Southeast,	Fresh,	Southeast,	Fresh,	Fair.
5	78	82	29.82	29.70	Southeast,	Pleasant,	Southeast,	Pleasant,	Fair.
6	79	82	29.74	29.63	Southeast,	Light,	Southeast,	Brisk,	Fair.
7	77	82	29.66	29.58	Southeast,	Fresh,	South,	Fresh,	Squally and rain.
8	77	82	29.72	29.58	Southeast,	Fresh,	Southwest,	Brisk,	Cloudy.
9	79	82	29.66	29.64	Southeast,	Fresh,	West,	Brisk,	Squally and rain.
10	80	84	29.68	29.64	Northwest,	Light,	West,	Light,	Fair.
11	76	86	29.80	29.62	East,	Calm,	Southwest,	Light,	Fair.
12	78	87	29.64	29.58	South,	Light,	West,	Brisk,	Fair.
13	77	85	29.88	29.68	West,	Light,	West,	Brisk,	Fair.
14	78	84	29.88	29.70	East,	Brisk,	East,	Brisk,	Fair.
15	78	82	29.92	29.67	East,	Fresh,	East,	Fresh,	Cloudy.
16	78	80	29.90	29.72	East,	Very fresh,	East,	Very fresh,	Fair.
17	77	82	29.88	29.80	East,	Fresh,	East,	Fresh,	Fair.
18	77	82	29.90	29.78	East,	Fresh,	East,	Fresh,	Fair.
19	78	81	29.92	29.80	East,	Fresh,	East,	Brisk,	Fair.
20	78	82	29.90	29.82	East,	Fresh,	East,	Fresh,	Cloudy and rain.
21	74	77	29.98	29.92	East,	Fresh,	East,	Fresh,	Cloudy and rain.
22	75	81	29.90	29.80	East,	Fresh,	East,	Brisk,	Fair.
23	77	87	29.78	29.78	Southeast,	Light,	Southeast,	Light,	Fair.
24	78	88	29.72	29.65	South,	Calm,	South,	Calm,	Fair.
25	79	88	29.64	29.46	South,	Light,	Southeast,	Light,	Clear and pleasant.
26	80	88	29.64	29.50	Southeast,	Pleasant,	Southeast,	Pleasant,	Fair.
27	81	79	29.62	29.72	South,	Fresh,	East,	Brisk,	Cloudy; (severe squall at noon.)
28	79	79	29.60	29.62	South,	Fresh,	South,	Fresh,	Cloudy.
29	78	84	29.70	29.74	South,	Fresh,	Southwest,	Fresh,	Fair.
30	78	83	29.76	29.68	Southwest,	Light,	Southwest,	Light,	Cloudy.
31	78	84	29.78	29.70	West,	Light,	West,	Light,	Fair.

6.50 inches rain.

JUNE, 1886.

Day of month.	Thermometer.		Barometer.		Winds—morning.		Winds—afternoon.		Character of weather.
	Sunrise.	2 p. m.	Sunrise.	2 p. m.	Course.	Velocity.	Course.	Velocity.	
June 1	83	82	29.56	29.57	Southwest,	-	Southwest,	Brisk,	Clear and pleasant.
2	79	84	29.60	29.62	South,	-	South,	Fresh,	Cloudy and squally.
3	71	82	29.65	29.72	Southwest,	-	Southwest,	Fresh,	Cloudy.
4	76	82	29.60	29.64	Southwest,	-	West,	Fresh,	Squally.
5	78	84	29.60	29.60	South,	-	South,	Fresh,	Fair.
6	77	80	29.80	29.70	South,	-	Southeast,	Light,	Cloudy.
7	78	84	29.86	29.84	South,	-	Southwest,	Calm,	Fair.
8	79	88	29.84	29.68	Variable,	-	South,	Calm,	Cloudy.
9	78	84	29.83	29.80	Northwest,	-	East,	Light,	Fair.
10	76	84	29.90	29.74	East,	-	Northeast,	Pleasant,	Fair.
11	78	85	29.86	29.72	East,	-	East,	Brisk,	Fair.
12	78	86	29.80	29.66	South,	-	Southwest,	Light,	Fair.
13	81	87	29.80	29.78	West,	-	West,	Calm,	Fair.
14	80	88	29.90	29.78	West,	-	West,	Light,	Fair.
15	81	87	29.85	29.72	North,	-	Southeast,	Calm,	Clear and pleasant.
16	82	87	29.82	29.80	East,	-	East,	Brisk,	Fair.
17	82	84	29.84	29.84	East,	-	East,	Brisk,	Fair.
18	81	83	29.92	29.90	East,	-	East,	Brisk,	Fair.
19	81	85	29.90	29.86	East,	-	East,	Brisk,	Fair.
20	81	88	29.86	29.70	East,	-	East,	Brisk,	Fair.
21	81	88	29.82	29.70	East,	-	Southeast,	Light,	Fair.
22	83	88	29.80	29.70	Southeast,	-	East,	Calm,	Clear and pleasant.
23	82	88	29.80	29.58	East,	-	Southeast,	Light,	Fair.
24	81	88	29.78	29.64	Southeast,	-	Southeast,	Calm,	Fair.
25	82	88	29.74	29.60	South,	-	South,	Calm,	Clear and pleasant.
26	83	88	29.76	29.62	South,	-	South,	Light,	Fair.
27	84	88	29.70	29.68	Southeast,	-	South,	Calm,	Fair.
28	83	88	29.80	29.74	South,	-	West,	Brisk,	Squally.
29	82	88	29.82	29.76	South,	-	West,	Fresh,	Squally.
30	83	88	29.84	29.72	Southeast,	-	Southeast,	Light,	Fair.

JULY, 1836.

Day of month.	Thermometer.		Barometer.		Winds—morning.		Winds—afternoon.		Character of weather.
	Sunrise.	2 p.m.	Sunrise.	2 p.m.	Course.	Velocity.	Course.	Velocity.	
July 1	83	88	29.83	29.80	East,	Pleasant,	East,	Pleasant,	Clear and pleasant.
2	84	88	29.78	29.80	East,	Briak,	Southeast,	Briak,	Fair.
3	85	88	29.78	29.68	Southeast,	Briak,	Southeast,	Briak,	Fair.
4	84	86	29.82	29.76	Southeast,	Briak,	Southeast,	Briak,	Fair.
5	84	84	29.80	29.80	East,	Fresh,	East,	Fresh,	Fair.
6	84	86	29.84	29.80	East,	Fresh,	East,	Fresh,	Fair.
7	82	86	29.88	29.74	Southeast,	Calm,	East,	Light,	Fair.
8	82	85	29.74	29.74	Southeast,	Briak,	Southeast,	Briak,	Fair.
9	82	87	29.86	29.80	East,	Briak,	East,	Briak,	Clear and pleasant.
10	84	88	29.78	29.66	Southeast,	Light,	Southeast,	Light,	Clear and pleasant.
11	82	88	29.80	29.72	South,	Light,	South,	Light,	Fair.
12	83	88	29.76	29.66	South,	Light,	West,	Briak,	Fair.
13	83	87	29.64	29.68	West,	Briak,	West,	Briak,	Fair.
14	80	79	29.66	29.66	Southwest,	Fresh,	West,	Fresh,	Cloudy.
15	80	83	29.70	29.70	Southwest,	Very fresh,	West,	Very fresh,	Cloudy and rain.
16	79	80	29.74	29.70	West,	Very fresh,	West,	Very fresh,	Cloudy and rain.
17	79	79	29.74	29.76	West,	Fresh,	Southwest,	Very fresh,	Cloudy and rain.
18	77	85	29.88	29.74	South,	Calm,	South,	Light,	Cloudy.
19	80	86	29.84	29.86	East,	Briak,	East,	Pleasant,	Fair.
20	81	88	29.90	29.74	East,	Briak,	East,	Calm,	Fair.
21	81	87	29.84	29.74	East,	Calm,	South,	Light,	Fair.
22	82	87	29.72	29.80	South,	Fresh,	South,	Briak,	Fair.
23	82	88	29.74	29.70	South,	Light,	Southeast,	Calm,	Fair.
24	83	88	29.84	29.74	South,	Light,	South,	Pleasant,	Fair.
25	83	87	29.86	29.70	East,	Briak,	East,	Briak,	Fair.
26	82	87	29.84	29.74	East,	Briak,	East,	Briak,	Fair.
27	82	86	29.84	29.74	East,	Fresh,	East,	Briak,	Fair.
28	82	86	29.84	29.76	East,	Fresh,	East,	Fresh,	Fair.
29	82	88	29.82	29.70	East,	Fresh,	East,	Briak,	Fair.
30	82	88	29.80	29.78	East,	Light,	East,	Briak,	Fair.
31	82	88	29.85	29.80	Southeast,	Pleasant,	Southeast,	Pleasant,	Fair.

5.34 inches rain.

5.34 inches rain.

AUGUST, 1886.

Day of month.	Thermometer.		Barometer.		Winds—morning.		Winds—afternoon.		Character of weather.
	Sunrise.	2 p. m.	Sunrise.	2 p. m.	Course.	Velocity.	Course.	Velocity.	
August 1	83	87	29.92	29.90	East,	Briak,	East,	Fresh,	Fair.
2	83	84	29.90	29.90	East,	Fresh,	East,	Very fresh,	Fair.
3	80	84	29.94	29.88	East,	Fresh,	East,	Fresh,	Cloudy and rain.
4	83	85	29.84	29.82	East,	Fresh,	East,	Fresh,	Fair.
5	82	86	29.84	29.80	East,	Fresh,	East,	Fresh,	Cloudy.
6	82	86	29.86	29.82	East,	Fresh,	East,	Fresh,	Fair.
7	82	86	29.86	29.80	East,	Fresh,	East,	Fresh,	Squally and light rain.
8	81	86	29.90	29.80	East,	Very fresh,	East,	Fresh,	Cloudy.
9	81	87	29.86	29.78	East,	Fresh,	East,	Fresh,	Fair.
10	82	88	29.78	29.74	East,	Light,	Southeast,	Calm,	Fair.
11	81	88	29.80	29.76	South,	Light,	West,	Light,	Fair.
12	82	88	29.74	29.74	West,	Light,	West,	Light,	Fair.
13	83	88	29.74	29.76	West,	Calm,	West,	Light,	Fair.
14	83	88	29.74	29.60	Southeast,	Calm,	South,	Light,	Fair.
15	84	88	29.70	29.62	Southeast,	Pleasant,	Southeast,	Pleasant,	Fair.
16	84	88	29.80	29.64	East,	Pleasant,	East,	Briak,	Fair.
17	84	88	29.72	29.64	East,	Fresh,	East,	Fresh,	Fair.
18	83	88	29.72	29.62	Southeast,	Light,	South,	Light,	Fair.
19	82	89	29.78	29.60	South,	Light,	South,	'alm,	Fair.
20	82	89	29.78	29.58	South,	Pleasant,	South,	Calm,	Clear and pleasant.
21	83	88	29.80	29.56	Southeast,	Light,	South,	Calm,	Fair.
22	83	88	29.76	29.58	South,	Light,	South,	Calm,	Clear and pleasant.
23	83	88	29.74	29.60	Southeast,	Light,	Southeast,	Light,	Clear and pleasant.
24	83	88	29.78	29.58	Southeast,	Briak,	Southeast,	Briak,	Fair.
25	84	88	29.84	29.62	East,	Pleasant,	Southeast,	Pleasant,	Fair.
26	84	88	29.82	29.60	Southeast,	Briak,	Southeast,	Pleasant,	Fair.
27	83	88	29.80	29.58	South,	Pleasant,	Southeast,	Light,	Fair.
28	84	89	29.82	29.58	Southeast,	Light,	Variable,	Calm,	Cloudy and squally.
29	84	89	29.80	29.62	Northeast,	Light,	Northeast,	Light,	Cloudy and squally.
30	83	86	29.78	29.70	East,	Light,	East,	Briak,	Cloudy.
31	81	86	29.86	29.66	East,	Pleasant,	East,	Light,	1.69 inches rain.

SEPTEMBER, 1886.

Day of month.	Thermometer.		Barometer.		Winds—morning.		Winds—afternoon.		Character of weather.
	Sunrise.	2 p.m.	Sunrise.	2 p. m.	Course.	Velocity.	Course.	Velocity.	
Sept'r 1	82	86	29.88	29.80	South,	Light,	South,	Light,	Cloudy and rain.
2	82	85	29.86	29.74	Variable,	Light,	Variable,	Light,	Squally and rain.
3	80	84	29.92	29.80	Variable,	Light,	Variable,	Light,	Fair.
4	82	86	29.88	29.78	Southeast,	Light,	Southeast,	Light,	Fair.
5	83	86	29.82	29.78	Southeast,	Light,	Southeast,	Light,	Fair.
6	82	88	29.82	29.70	Southeast,	Calm,	Southeast,	Calm,	Fair.
7	83	88	29.80	29.68	East-southeast,	Pleasant,	Southeast,	Light,	Fair.
8	82	88	29.84	29.64	South,	Calm,	East,	Brisk,	Squally and rain.
9	83	87	29.86	29.68	East,	Light,	East,	Brisk,	Fair.
10	83	86	29.84	29.88	East,	Pleasant,	East,	Brisk,	Squally and rain.
11	83	82	29.84	29.86	East,	Brisk,	East,	Fresh,	Squally and rain.
12	82	83	29.86	29.80	East,	Fresh,	East,	Fresh,	Squally and rain.
13	82	85	29.80	29.80	East,	Fresh,	East,	Fresh,	Squally and rain.
14	81	85	29.86	29.78	East,	Very fresh,	East,	Very fresh,	Squally and rain.
15	77	82	29.86	29.80	East,	Very fresh,	East,	Fresh,	Squally and rain.
16	80	81	29.84	29.84	East,	Brisk,	East,	Fresh,	Squally and rain.
17	80	82	29.88	29.81	East,	Fresh,	East,	Brisk,	Squally and rain.
18	80	84	29.78	29.78	East,	Fresh,	East,	Fresh,	Squally and rain.
19	81	84	29.86	29.80	East,	Fresh,	East,	Fresh,	Fair.
20	82	80	29.82	29.80	East,	Fresh,	East,	Fresh,	Fair.
21	79	83	29.84	29.84	South,	Fresh,	South,	Fresh,	Fair.
22	82	84	29.90	29.88	Southeast,	Fresh,	Southeast,	Fresh,	Fair.
23	81	84	29.92	29.92	East,	Fresh,	East,	Fresh,	Fair.
24	81	84	29.90	29.96	East,	Fresh,	East,	Fresh,	Fair.
25	81	86	29.87	29.74	North,	Fresh,	East,	Brisk,	Fair.
26	82	88	29.80	29.70	East,	Pleasant,	East,	Brisk,	Fair.
27	83	88	29.82	29.74	East,	Light,	East,	Light,	Fair.
28	83	88	29.80	29.68	East,	Light,	Variable,	Light,	Fair.
29	84	86	29.74	29.70	Variable,	Light,	Variable,	Light,	Fair.
30	80	84	29.72	29.66	East,	Fresh,	Southeast,	Very fresh,	Cloudy and rain. 5.90 inches rain.

OCTOBER, 1886.

Day of month.	Thermometer.		Barometer.		Winds—morning.		Winds—afternoon.		Character of weather.
	Sunrise.	2 p. m.	Sunrise.	2 p. m.	Course.	Velocity.	Course.	Velocity.	
Oct'ber 1	82	82	29.70	29.67	East,	Fresh,	East,	Very fresh,	Squally and rain.
2	77	80	29.73	29.53	East,	Very fresh,	Northwest,	Very fresh,	Cloudy and rain; wind shifted 7 p. m.; from 11 a. m. to 4 p. m. gale S. S. E.
3	77	83	29.68	29.60	Northwest,	Brisk,	Northwest,	Brisk,	Fair.
4	80	86	29.68	29.66	Northwest,	Light,	Northwest,	Light,	Fair.
5	75	80	29.88	29.76	North,	Fresh,	Northwest,	Very fresh,	Fair.
6	77	78	29.88	29.88	East,	Very fresh,	East,	Very fresh,	Cloudy.
7	78	80	29.88	29.80	East,	Very fresh,	East,	Very fresh,	Cloudy.
8	78	78	29.90	29.80	East,	Very fresh,	East,	Fresh,	Fair.
9	78	81	29.80	29.74	East,	Fresh,	East,	Fresh,	Fair.
10	78	81	29.74	29.72	Northwest,	Brisk,	North,	Light,	Fair.
11	79	80	29.74	29.68	North,	Brisk,	North,	Brisk,	Fair.
12	74	80	29.92	29.84	North,	Fresh,	Northwest,	Fresh,	Fair.
13	73	80	30.00	29.84	Northwest,	Fresh,	Northwest,	Fresh,	Fair.
14	74	78	29.90	29.80	North,	Fresh,	North,	Brisk,	Fair.
15	74	80	29.92	29.80	Northwest,	Pleasant,	Northwest,	Light,	Fair.
16	78	83	29.86	29.82	Northwest,	Light,	West,	Calm,	Fair.
17	78	83	30.00	29.80	North,	Brisk,	Northwest,	Brisk,	Fair.
18	77	82	30.02	29.94	Northwest,	Brisk,	East,	Fresh,	Fair.
19	79	84	29.90	29.84	East,	Fresh,	East,	Brisk,	Fair.
20	81	85	29.86	29.82	Southeast,	Pleasant,	South,	Calm,	Fair.
21	83	86	29.90	29.88	Northwest,	Calm,	East,	Fresh,	Cloudy.
22	78	80	29.94	29.98	East,	Fresh,	East,	Fresh,	Cloudy.
23	77	78	30.06	30.04	East,	Fresh,	East,	Fresh,	Fair.
24	75	78	30.06	30.04	Northwest,	Fresh,	East-northeast,	Fresh,	Fair.
25	75	77	30.04	30.00	Northwest,	Fresh,	Northwest,	Fresh,	Fair.
26	74	78	30.00	30.00	North,	Fresh,	North,	Light,	Fair.
27	74	79	30.00	29.88	North,	Pleasant,	Northwest,	Brisk,	Fair.
28	75	81	29.90	29.86	Northwest,	Light,	Northwest,	Light,	Fair.
29	77	85	29.92	29.80	Southeast,	Calm,	East,	Light,	Fair.
30	76	86	29.94	29.84	East,	Calm,	Southeast,	Light,	Fair.
31	76	86	29.96	29.80	Southeast,	Light,	South,	Light,	Fair. [3.86 inches rain.]

NOVEMBER, 1886.

Day of month.	Thermometer.		Barometer.		Winds—morning.		Wind—afternoon.		Character of weather.
	Sunrise.	2 p. m.	Sunrise.	2 p. m.	Course.	Velocity.	Course.	Velocity.	
Nov ^r 1	78	84	29.84	29.82	South,	Light,	South,	Light,	Fair.
2	74	80	29.96	29.98	West,	Fresh,	West,	Fresh,	Fair.
3	68	76	30.14	30.00	North,	Pleasant,	Northwest,	Fresh,	Fair.
4	67	74	30.12	30.00	North,	Brisk,	Northwest,	Light,	Fair.
5	69	70	30.14	30.12	North,	Fresh,	North,	Fresh,	Fair.
6	65	69	30.20	30.14	North,	Fresh,	North,	Fresh,	Fair.
7	70	74	30.16	30.06	North,	Fresh,	Northeast,	Brisk,	Fair.
8	69	75	30.14	30.00	Northeast,	Fresh,	Northeast,	Fresh,	Fair.
9	74	78	30.02	30.00	East,	Fresh,	East,	Fresh,	Cloudy part of day.
10	76	79	30.00	30.00	East,	Fresh,	Southeast,	Fresh,	Cloudy part of day.
11	78	80	29.98	30.04	Southeast,	Pleasant,	North,	Light,	Fair.
12	78	80	30.00	29.94	Northeast,	Light,	North,	Calm,	Clear and pleasant.
13	79	81	29.96	29.92	North,	Light,	Southeast,	Brisk,	Fair.
14	78	77	29.94	29.94	Northwest,	Very fresh,	Northwest,	Fresh,	Cloudy and squally.
15	68	65	30.10	30.15	Northwest,	Fresh,	North,	Brisk,	Fair.
16	64	66	30.24	30.24	North,	Brisk,	Northeast,	Brisk,	Fair.
17	66	70	30.34	30.30	North,	Brisk,	East,	Very fresh,	Fair.
18	70	75	30.24	30.16	East,	Very fresh,	East,	Very fresh,	Cloudy.
19	70	74	30.14	30.10	East,	Fresh,	East,	Fresh,	Fair.
20	76	78	30.06	30.00	East,	Fresh,	Southeast,	Fresh,	Fair.
21	75	76	30.06	30.06	South,	Calm,	Northeast,	Light,	Cloudy.
22	71	74	30.14	30.14	North,	Fresh,	Northeast,	Fresh,	Fair.
23	72	72	30.14	30.12	Northeast,	Fresh,	North,	Fresh,	Cloudy.
24	66	69	30.24	30.14	North,	Fresh,	North,	Brisk,	Fair.
25	66	70	30.32	30.26	North,	Fresh,	North,	Brisk,	Clear and pleasant.
26	61	66	30.34	30.32	North,	Brisk,	North,	Brisk,	Clear and pleasant.
27	62	67	30.30	30.28	North,	Brisk,	North,	Brisk,	Clear and pleasant.
28	64	68	30.22	30.20	North,	Brisk,	Northeast,	Brisk,	Clear and pleasant.
29	64	64	30.10	30.16	Northeast,	Light,	North,	Light,	1.22 inches rain.
30	64	68	30.26	30.22	North,	Light,	North,	Light,	

Day of month.	Thermometer.		Barometer.		Winds—morning.		Winds—afternoon.		Character of weather.
	Sunrise.	2 p. m.	Sunrise.	2 p. m.	Course.	Velocity.	Course.	Velocity.	
Dec. 1	65	68	30.23	30.20	Northeast,	Light,	East,	Calm,	Fair.
2	65	71	30.20	30.10	North,	Calm,	Northwest,	Calm,	Fair.
3	60	69	30.38	30.30	East,	Brisk,	North,	Brisk,	Clear and pleasant.
4	69	73	30.32	30.20	Southeast,	Fresh,	East,	Fresh,	Fair.
5	73	78	30.18	30.08	Southeast,	Fresh,	South,	Light,	Fair.
6	74	81	30.06	29.96	North,	Light,	South,	Light,	Fair.
7	69	74	30.20	30.32	North,	Fresh,	North,	Fresh,	Fair.
8	61	70	30.42	30.30	North,	Fresh,	East,	Fresh,	Fair.
9	66	70	30.30	30.24	Northeast,	Light,	Northeast,	Pleasant,	Fair.
10	69	74	30.20	29.96	North,	Pleasant,	Northeast,	Light,	Clear and pleasant.
11	70	74	30.26	30.10	North,	Light,	Northeast,	Light,	Clear and pleasant.
12	69	76	30.26	30.04	Northeast,	Brisk,	East,	Pleasant,	Fair.
13	73	78	30.08	30.08	Southeast,	Brisk,	Southwest,	Light,	Fair.
14	71	76	30.18	30.24	North,	Brisk,	North,	Calm,	Fair.
15	63	70	30.34	30.10	North,	Brisk,	East,	Pleasant,	Fair.
16	71	77	30.10	30.06	Southeast,	Brisk,	South,	Brisk,	Fair.
17	75	69	30.00	30.02	South,	Brisk,	North,	Brisk,	Cloudy part of day.
18	66	68	30.34	30.34	North,	Brisk,	North,	Fresh,	Cloudy.
19	70	74	30.20	30.20	Northeast,	Very fresh,	Northeast,	Very fresh,	Cloudy.
20	74	76	30.22	30.20	Northeast,	Fresh,	East,	Fresh,	Cloudy part of day.
21	74	76	30.20	30.28	Northwest,	Fresh,	North,	Fresh,	Fair.
22	62	66	30.46	30.26	North,	Fresh,	Northeast,	Very fresh,	Cloudy.
23	68	71	30.30	30.26	East,	Fresh,	East,	Fresh,	Fair.
24	70	72	30.28	30.20	East,	Fresh,	East,	Fresh,	Fair.
25	72	74	30.20	30.22	East,	Fresh,	East,	Fresh,	Fair.
26	72	75	30.24	30.16	Southeast,	Fresh,	Southeast,	Fresh,	Fair.
27	72	76	30.22	30.26	South,	Light,	Northwest,	Brisk,	Fair.
28	60	66	30.46	30.40	North,	Fresh,	North,	Fresh,	Fair.
29	55	62	30.46	30.42	North,	Fresh,	North,	Pleasant,	Clear and pleasant.
30	56	64	30.44	30.34	North,	Brisk,	North,	Light,	Clear and pleasant.
31	60	70	30.42	30.26	North,	Brisk,	Northeast,	Pleasant,	Clear and pleasant. 0.00 inches rain.

JANUARY, 1887.

Day of month.	Thermometer.		Barometer.		Winds—morning.		Winds—afternoon.		Character of weather.
	Sunrise.	2 p. m.	Sunrise.	2 p. m.	Course.	Velocity.	Course.	Velocity.	
January 1	64	72	30.23	30.20	South,	Light,	Southwest,	Light,	Clear and pleasant.
2	65	60	29.94	30.24	West,	Fresh,	Northwest,	Very fresh,	Cloudy; squall 7 a. m. severe.
3	50	57	30.30	30.34	Northwest,	Fresh,	Northwest,	Fresh,	Fair.
4	55	62	30.26	30.24	Northwest,	Light,	Northwest,	Light,	Fair.
5	64	72	30.10	30.20	South,	Pleasant,	West,	Pleasant,	Fair.
6	66	73	30.16	30.08	South,	Calm,	West,	Calm,	Fair.
7	57	64	30.30	30.28	North,	Fresh,	North,	Brisk,	Fair.
8	54	62	30.34	30.22	North,	Pleasant,	North,	Brisk,	Fair.
9	59	64	30.20	30.06	North,	Brisk,	East,	Pleasant,	Fair.
10	68	78	29.94	29.94	South,	Brisk,	South,	Light,	Clear and pleasant.
11	71	78	30.18	29.96	North,	Calm,	East,	Light,	Fair.
12	72	80	30.10	29.98	Southeast,	Brisk,	South,	Light,	Clear and pleasant.
13	73	82	30.20	29.98	South,	Calm,	Southeast,	Calm,	Fair.
14	73	84	30.10	30.06	South,	Calm,	South,	Calm,	Clear and pleasant.
15	71	68	30.12	30.10	Northwest,	Fresh,	Northwest,	Fresh,	Clear and pleasant.
16	62	64	30.20	30.20	North,	Fresh,	North,	Brisk,	Cloudy and rain.
17	59	64	30.30	30.24	North,	Pleasant,	Northwest,	Calm,	Fair.
18	62	66	30.07	29.98	North,	Light,	West,	Light,	Cloudy and rain.
19	66	72	30.16	30.20	North,	Calm,	North,	Calm,	Fair.
20	68	74	30.22	30.24	Northwest,	Calm,	Northwest,	Calm,	Fair.
21	70	66	30.03	30.06	Southwest,	Fresh,	Northwest,	Very fresh,	8 a. m. squall, fresh.
22	60	66	30.30	30.22	North,	Fresh,	Northwest,	Brisk,	Fair.
23	60	68	30.30	30.28	North,	Pleasant,	Northwest,	Light,	Fair.
24	62	67	30.38	30.28	North,	Brisk,	Northwest,	Light,	Fair.
25	68	75	30.20	30.00	Southeast,	Brisk,	Southeast,	Brisk,	Fair.
26	73	70	29.98	30.08	West,	Fresh,	West,	Fresh,	Cloudy and rain.
27	65	66	30.12	30.20	North,	Pleasant,	Northwest,	Pleasant,	Fair.
28	60	69	30.30	30.20	North,	Brisk,	Northeast,	Fresh,	Fair.
29	70	76	30.04	30.00	Southeast,	Fresh,	West,	Light,	Cloudy and rain.
30	72	74	30.06	30.10	South,	Light,	West,	Brisk,	Clear and pleasant.
31	68	74	30.18	30.16	North,	Light,	North,	Light,	3.72 inches rain.

DECEMBER, 1887.

Day of month.	Thermometer.		Barometer.		Winds—morning.		Winds—afternoon.		Character of weather.
	Sunrise.	2 p. m.	Sunrise.	2 p. m.	Course.	Velocity.	Course.	Velocity.	
Dec. 1	69	74	30.32	30.26	North,	Fresh,	Northeast,	Fresh,	Fair.
2	70	74	30.22	30.12	North,	Brisk,	Northeast,	Brisk,	Fair.
3	72	74	30.12	30.10	Northeast,	Fresh,	Northeast,	Fresh,	Cloudy and rain.
4	74	77	30.18	30.10	East,	Light,	East,	Light,	Fair.
5	74	77	30.28	30.18	East,	Light,	East,	Brisk,	Fair.
6	74	76	30.30	30.22	East,	Brisk,	East,	Brisk,	Fair.
7	73	76	30.32	30.18	Northeast,	Brisk,	Northeast,	Brisk,	Fair.
8	73	78	30.18	30.08	Northeast,	Light,	East,	Light,	Fair.
9	75	78	30.14	30.04	East,	Light,	South,	Brisk,	Fair.
10	76	79	30.08	29.98	South,	Light,	Southwest,	Light,	Fair.
11	72	70	30.24	30.26	North,	Fresh,	North,	Brisk,	Fair.
12	72	74	30.30	30.16	East,	Brisk,	East,	Brisk,	Fair.
13	76	78	29.98	29.90	South,	Fresh,	Southwest,	Fresh,	Cloudy and rain.
14	73	70	30.06	30.10	West,	Brisk,	Westnorthwest,	Brisk,	Fair.
15	62	68	30.50	30.34	North,	Brisk,	Northeast,	Pleasant,	Fair.
16	70	76	30.32	30.20	East,	Fresh,	East,	Brisk,	Fair.
17	76	80	30.22	30.16	East,	Brisk,	Southeast,	Pleasant,	Fair.
18	76	84	30.15	30.10	Southeast,	Pleasant,	South,	Light,	Fair.
19	76	84	30.18	30.12	South,	Light,	West,	Pleasant,	Fair.
20	68	76	30.44	30.40	North,	Fresh,	North,	Pleasant,	Fair.
21	62	66	30.50	30.44	North,	Fresh,	North,	Brisk,	Fair.
22	63	72	30.48	30.30	North,	Pleasant,	East,	Pleasant,	Fair.
23	70	78	30.32	30.32	East,	Pleasant,	Southeast,	Brisk,	Fair.
24	74	70	30.22	30.28	South,	Fresh,	Northwest,	Fresh,	Cloudy and rain.
25	64	68	30.66	30.58	North,	Brisk,	North,	Pleasant,	Fair.
26	68	72	30.62	30.58	North,	Fresh,	North,	Brisk,	Fair.
27	67	72	30.60	30.46	North,	Fresh,	North,	Pleasant,	Fair.
28	67	72	30.48	30.46	North,	Brisk,	North,	Brisk,	Fair.
29	65	70	30.45	30.48	North,	Fresh,	North,	Brisk,	Fair.
30	64	68	30.50	30.46	North,	Fresh,	North,	Brisk,	Fair.
31	65	71	30.58	30.42	North,	Pleasant,	North,	Pleasant,	Fair.

2.12 inches rain.

PROPAGATION OF FIBROUS-LEAVED PLANTS.

To the honorable the Committee on Agriculture of the House of Representatives of the United States.

WASHINGTON, D. C., February 3, 1838.

The introduction of fibrous-leaved plants into tropical Florida, their propagation throughout the sterile soils of all our Southern and South-western States, the production of their *fibrous foliage*, and the preparation of their *foliaceous fibres*, by small cultivators and family manufacturers, are topics which have occupied my heart, head, and hands, during the last ten years.

My unshaken opinions of the immense importance of the *endogenous* plants, whose *living leaves* yield *textile fibres*, have been expressed in numerous communications to the Government and to the people of these United States ; but as many sheets remain on the files of the Departments in Washington, and numerous letters have not yet appeared in the periodicals of agriculture, I now attempt to present a very brief abridgment of the contents of them all, for the consideration of your committee and of Congress. To excite the attention of my readers towards some details of some species of fibrous-leaved plants, I premise a few general statements applicable to the whole.

GENERAL STATEMENTS.

The fibrous-leaved plants are all hardy, productive, perennial plants, which profitably propagate themselves on sandy, stony, and swampy surfaces, in the sun and in the shade. Their fibrous leaves, produced in any soil and situation, with the least care or cultivation, may be cut in any weather and at every season of the year. These freshly-cut leaves may be immediately manufactured into excellent paper, so cheaply, that it will become as important an auxiliary to popular education as the printing-press itself. These living perennial leaves will yield their fibrous contents in the shortest possible time, with the simplest possible preparations, as the foliaceous fibres are extracted from the green leaves by simple scraping only ; and immediately after this mechanical separation, these parallel longitudinal fibres are ready for baling and exportation, or for manufacture. These fresh foliaceous fibres have so much individual strength, length, and elasticity, that they may be instantly wrought, untwisted, into very cheap forms and fabrics, for which the unspun cortical fibres of hemp and flax are entirely unserviceable. Moreover, these foliaceous fibres are so much cheaper, lighter, stronger, longer, more elastic, and more durable than cortical fibres, that they can be spun into thread, twine, and cordage, and can be woven into webs, muslins, or cloths, finer than cambric and coarser than canvass, which will become superior substitutes for similar manufactures of flax and hemp in the general consumption of mankind. Furthermore, many of said fibrous-leaved plants form excellent hedges for themselves and for other objects of cultivation, and the entire *leaves* of many species constitute the best materials for the simplest manufactures of the cheapest possible matting, baling, bagging, and other envelopes of merchandise, for the really domestic manufactures, or farm, family, and female manufactures of hats, bonnets, baskets, and other articles, by an innocent, independent, and rural population. A still more important con-

sideration attending the propagation of fibrous-leaved plants in the poorest soils, will be found in the fact, that, whether the staple desired be fibrous foliage for domestic manufactures, or foliaceous fibres for foreign exports, at least three-fourths of all the requisite labor can be accomplished much more cheaply by horse power than by human power. Moreover, as these perennial plants combine the merits of yielding the greatest possible produce with the least possible labor, in the poorest possible soils, their introduction will be an equivalent to the direct addition of absolute fertility to our hitherto most sterile districts, and of positive wealth to our hitherto poorest population.

Hence proceed my convictions that foliaceous fibres may be more profitably produced in the refuse lands of Carolina and Georgia, than cortical or capsular fibres in the richest sections of Ohio and of Louisiana; that hence, even the ruined fields of the Southern States will yield greater prosperity in the production of foliaceous fibres alone, than was ever obtained from their virgin loams by the cultivation of capsular fibres, notwithstanding cotton at present constitutes a great proportion of the whole exports of the United States.

Hence, also, my belief that, as the narcotic leaves of one native plant of Yucatan (which *did* take its name from the then dependent province of Tabasco) do actually afford an annual exportation of many millions in one staple of the South, so the fibrous leaves of another native plant of Yucatan, (which *may* take its name from the actual exporting port of Sisal,) will more probably afford an annual exportation of ten times as many millions of dollars in another staple of the South; and that this new staple will be still more important than all her old staples combined, not merely for the amount, value, and profit of the product itself, but also for the character of the lands, of the labor, and of the population it will employ.

Hence, also, my opinions that the propagation of fibrous-leaved plants in the actually worthless sands and swamps of the Southern States, will form a still more distinguished era in their agricultural prosperity than the invention of the cotton-gin; that the production of fibrous foliage and foliaceous fibres will create still more beneficial revolutions in the commerce and manufactures of all civilized nations than has yet been effected by the cultivation of the capsular fibres called cotton; and that, therefore, their introduction to the intelligent industry of our free institutions should be effectually favored by the statesmen of our nation, and by the philanthropists of the world.

I have the honor to be, gentlemen, very respectfully, your obedient servant,

HENRY PERRINE.

EXPLANATORY OBSERVATIONS.

Common Flax and common Hemp are obtained from the *bark* of the stems of their respective plants of the same name; hence the generic title of *Cortical fibres*. The substitutes for common flax and hemp, called Grass hemp, Grass flax, &c., are got from the *leaves* of their respective plants of different names; hence the generic phrase of *foliaceous fibres*. As cotton is obtained from a pod or capsule, the generic term *Capsular fibres* embraces it.

The fine cortical fibres called Common Flax, and the coarse cortical

fibres called Common Hemp, are both obtained from *dried barks* of a reticulated structure.

The fine foliaceous fibres called tropical flax, and the coarse foliaceous fibres called Sisal hemp, are both obtained from *green leaves* with longitudinal and parallel veins.

The common cortical fibres called flax and hemp, are separated by tedious, tardy, laborious, complicated, and frequently sickly processes.

The common foliaceous fibres, which are superior substitutes for both, are separated by a simple, speedy, and healthy process. The plants which furnish common flax and hemp are annuals, which exhaust the richest soils. The plants which yield the foliaceous substitutes are perennials, and enrich the poorest soils. Finally, the fibrous-leaved plants are principally composed of great masses of leaves alone; and it is a general fact, that the greater the size and the greater the number of leaves of plants, the more they derive their nourishment from the atmosphere, and the less do they depend on the earth

H. P.

FIBROUS-LEAVED PLANTS.

All flowering plants are divided, by botanists, into two great classes, called Monocotyledons and Dicotyledons, from peculiar characters of their *seeds*; or Endogens and Exogens, from peculiar characters of their *stems*; and they might be called by equally significant names from the peculiar characters of their *leaves*. The stems of Endogenous plants are properly *stalks*, cylindrical and undivided; the stems of Exogenous plants are properly *trunks*, conical and branched. A *section* of a *stalk* exhibits a homogeneous surface of porous materials, softest at the centre, hardest at the circumference, and *without bark*. If there be any appearance of a proper bark, it is made by the united bases of the adherent leaves; e. g. a Palm. A *section* of a *trunk* exhibits concentric circles of *bark* and wood, hardest at the heart, softest at the circumference, and with medullary rays from the central pith to the young external wood; e. g. an Oak. Hence plants of the first class may be at once known by the *absence of bark* from their *stalks*; and plants of the second class are always known by the *presence of bark* on their *trunks*.

Of Endogenous plants, the leaves have mostly *parallel veins*, and are generally *adherent to the stalk*. Examples: Indian Corn, Lily, Flag, Flax-lily, Bear-grass, Palmetto, Spanish bayonet, Pine-apples.

Of Exogenous plants, the leaves have mostly *branching and reticulated veins*, always *articulated* with the stem, and hence spontaneously falling. Examples: Chesnut, Currant, Flax and Hemp.

The Endogenous differ from the Exogenous plants, in their geographical distribution, as well as in their structure.

In the Equinoctial regions, the Endogenous plants form about 17 per cent. of the flowering plants. In the Variable zone, between 36 and 52, about 25 per cent.; and towards the Polar circles, about 33 per cent. The most important substances which they produce, are *farinaceous* and *saccharine* materials, and *foliaceous fibres*. The smaller grasses which yield wheat, &c. in terminal heads of grain; the large grass which yields maize in lateral ears of corn; and the equally large grass which yields

sugar in the juice of its stalk or cane, are all well known in the world : but those Endogenous plants whose *green living leaves* yield valuable *foliaceous fibres*, are not well known in even scientific society. It hence becomes necessary to give a brief outline of some leading Groups of Endogenous plants, in order to facilitate the communication of intelligence relative to individual species of fibrous-leaved plants, to be found under different tribes or families of plants in each group. Endeavoring to avoid, as much as possible, the use of technical terms, the few Botanical words necessarily employed will be defined and explained.

GROUPS OF ENDOGENOUS PLANTS.

Examining the flower of a common Lily, we discover that this flower is composed of six petals, or has six divisions, but that three alternate petals or divisions resemble each other more than they resemble the intermediate petals; and hence the flower is said to be *complete*, and *formed* upon a *ternary plan*. Examining the flower of a Mexican Lily (*Amaryllis reginæ*) the same formation is discovered. Both the common Lily and the Mexican Lily have six petalled flowers; they both also have six threads called *stamens*, growing out of the petals, and one central thread or column, called a Pistil. They have other points of resemblance, and yet there is one notable point of difference; that is, in the *non-adherence* of the flower of the Common Lily to the *ovary* or body, from which the central Pistil rises, and in the *adhesion* of the Flower of the Mexican Lily to its ovary, or future fruit. In the former case, Botanists say that the *Ovary* is *superior*; and in the latter, that the *Ovary* is *inferior*. Hence, in speaking of the *flower* itself, the epithets are reversed; that is, in the Common Lily, the *flower* is *inferior*; and in the Mexican Lily, the *flower* is *superior*; and the technical terms are *Hypogynous*, for the *inferior*; and *Epigynous*, for the *superior*. The same ideas, however, would be more plainly expressed by the epithets of *Non-adhering* and of *Adhering* flowers.

Hence we can embrace a *vast group* of Endogenous plants under the head of *Liliaceous flowers*, formed upon a ternary plan; and we can divide them into two *sub-groups*, by the *non-adhesion*, and by the *adhesion* of the flowers to the *ovary*, or infant fruit.

There is, however, another important section of Endogenous plants, whose flowers have characters rather difficult to be generalized in common language, especially as the species are not familiar to Americans. Some general ideas of them may be formed, by stating that the flowers are covered by a husk, or shuck, called a *Spathæ*, and are arranged along a stalk called a Spadix; and that hence they may be embraced under the head of *Spadicious flowers*; and these may be divided into three sub-sections, by the veins of their leaves running from the base to the apex in one division, and from the midrib to the margin in the other; and by the palmate leaves in the third.

LILIACEOUS FLOWERS.

Sub-group A.—Nonadherent.—Hypogynosæ.

§ 1. Alliance Liliales.—Leaves frequently succulent or coriaceous, with parallel longitudinal veins from base to apex.

Sub-group B.—Adherent.—Epigynosæ.

§ 1. Alliance Narcissales.—Leaves smooth or hairy, with their parallel veins running longitudinally from base to apex.

§ 2. Bromeliales.—Leaves rigid, channelled, dry or fleshy; often with a scurfy surface, and spiny at the point or edges.

SPADICEOUS FLOWERS.

§ 1. Pandales.—Leaves rigid, long linear lanceolate, embracing the stem, spirally overlapping, margins mostly spiny.

§ 2. Bananales.—Leaves with their parallel veins diverging from the midrib to the margin.

§ 3. Palmales.—Leaves clustered terminal, pinnate, or fanform, very large, plaited while young.

LILIACEOUS FLOWERS.—HYPOGYNOUS SUB-GROUP.

Lily tribe, or Liliacæ.

The plants of this tribe bear a fruit which is three-celled, many-seeded, dry or succulent, and capsular; their roots are fibrous or fasciculate. Stem none, except a bulb or tuber, and is creeping, erect or arborescent. The leaves are either sessile, or with a narrow leafy petiole, shaped like a lance or sword.

LILIACEOUS FLOWERS.—EPIGYNOUS SUB-GROUP.

Amaryllis tribe, or Amaryllidacæ.

The plants of this tribe bear a fruit which is three-celled, many-seeded, three-valved, capsular, opening in the cells. They are generally bulbous, sometimes fibrous-rooted, occasionally with a tall flower-stalk; their leaves have generally the shape of a sword.

Pine-Apple tribe, or Bromeliacæ.

The plants of this tribe bear a fruit which is three-celled, many-seeded, capsular, or succulent; the roots are fasciculate, fibrous or tuberous; stems none at all, or very short, covered with leaves which are spiny at the edge or point. Flower-stalk occasionally very tall; plants perish immediately after flowering, and suckers spring up from the roots.

GENERAL REMARKS.

By comparing the characters of the Lily tribe and of the Amaryllis tribe, it will be seen that the only notable difference exists in the position of the flower. They agree in the shape and structure of their leaves, being sword or lance-shaped, and with the veins running parallelly and longitudinally from the base to the apex. In these characters of vegetation the Pine-apple tribe resembles both.

In the Flag tribe, the leaves overlap each other parallelly, as in the Iris. The blue flag (*Iris versicolor*) is often called the Snake Lily; and the *Amaryllis Equestris*, the Barbadoes Lily.

SPADICEOUS FLOWERS.

§ 1. *Screw-pine tribe, or Pandanaceæ.*

The plants of this tribe have generally arborescent stems, usually sending down aerial roots. The leaves are imbricated spirally around the axes, so as to give the stems a sort of cork-screw appearance, before the trace of the leaves is worn away. Hence the aspect of the foliage of these plants being that of gigantic Pine-apple plants; but with a spiral arrangement of their large leaves, they are called the Screw-pine tribe.

§ 2. *Banana tribe, or Musaceæ.*

Large herbaceous plants, mostly tropical; stemless, or without a proper stalk; petioles, or footstalk of the leaves, long, broad, and sheathing, and thus forming a cylindrical or conical column, often very large. The convoluted lamellæ which compose these columns have parallel longitudinal fibres, of which the central portion extends even into the midrib of the gigantic leaves; which are themselves composed of *thin laminæ*, with *fine parallel veins diverging* from the midrib to the margin.

§ 3. *Palm tribe, or Palmæ.*

These plants are arborescent, with sub-cylindrical stems, growing by the constant development of one central terminal bud; the surface of the stem is occasionally rough, with the dilated half-sheathing bases of the leaves or their scars.

§ 1. *Geography of the Lily tribe, and general remarks.*

The species of this tribe are scattered widely over the world, but they are much more abundant in the temperate zone than between the tropics, where they chiefly exist in an arborescent state. Aloes are found mostly in the south of Africa; yet one species is a native of the West Indies, and two or three more of Arabia and the East. Dracænas, the most gigantic of the order, attain their largest size in the Canary islands. A *D. Draco* is described to be from 70 to 75 feet high, and 15 or 16 feet in diameter at the base. In the East Indies, Liliaceous plants are rare. In New Holland, they form a distinctly marked feature of the vegetation. In one section of them, called the Aloineæ, the stem is usually developed, and sometimes arborescent, and the leaves are generally succulent. In another section, called Asparageæ, the leaves in the stemless species are often *coriaceous* and *permanent*. In countries where the woody and prickly species of Aloes naturally abound, they are often planted as hedges; some species so much resemble certain species of Agave, and of Bromelia, that they are likely confounded by travellers in their descriptions of the uses of these plants. Hence, *Karatas* is a vague name for the species of prickly-leaved plants, and for hedges, whether appertaining to the genus of Aloes,

of Agave, or of Bromelia. Under the Asparagus section is arranged the genus Yucca, of which five species are indigenous to the worst soils of the United States, from the Potomac to the Mississippi, and of which are two species, now naturalized in the Northern States, especially the Yucca filamentosa, whose synonymes are Bear-grass, Silk-grass, Eves-thread, &c.

The Phormiumtenax, or New Zealand Flax Lily, has flourished several years in the open air of Charleston, South Carolina, and is now notoriously acclimated in the south of France, but has become an important staple of agriculture and of manufactures for that kingdom. Although some species of this tribe afford valuable food, and others valuable medicines, yet the most important plants are those whose green living leaves yield valuable foliaceous fibres, by simple scraping only, under the names of Yucca filamentosa, and of Phormiumtenax. I shall give a brief account of these superior substitutes for common flax and hemp.

§ 2. Geography of the Pine-apple tribe, and general remarks.

All the species of this tribe are natives of the continents and islands of America, whence they have emigrated eastward in such numbers that they constitute a part of the present Flora of the old world. Since the sixteenth century, species of Agave have become wild throughout all the south of Europe, the north of Africa, and the adjacent islands; and whenever introduced, they have naturalized themselves, have propagated themselves, and have taken possession of the worst soils, like actual natives. They are all capable of existing a long time in dry hot air alone, without contact with the earth. They are all adapted to propagate themselves in the most arid sandy or stony soils. The name of Agave Virginia, indicates that one species is indigenous to the United States. Some species of Bromelia prefer to propagate themselves in the shade of trees, and to form the undergrowth of forests. Besides the delicious pine-apple, which has travelled from Peru to the West India Islands, and thence to the East Indies, several species of true Bromelia have also edible fruit. Both the *thick and fleshy* leaved Agaves, and the *thin and rigid* leaved Bromelias, with thorns or prickles on their edges or at their points, make excellent hedges. Species of Agave are thus used for hedges in Italy, Spain, Portugal, and even in Switzerland. But the most important properties of several species of Agave, and of Bromelia, are found in their *fibrous leaves*; by *simple scraping only*, *foliaceous fibres* are obtained from the *living green leaves*, which are superior substitutes for common hemp and common flax. Under the names of Agave Sisalana, and Bromelia Pita, I shall give a brief account of the substitutes for hemp and for flax, being introduced by me from the Mexican peninsula of Yucatan to the American peninsula of Florida. The *coarse foliaceous* fibres of the Agave, are known in our markets by the names of Sisal Hemp and Grass Hemp. The fine foliaceous fibres of the Bromelia, are known by the English synonymes of Grass, Flax, Vegetable Silk, &c.

§ 3. Geography of the Screw-pine tribe, and general remarks.

The species of this tribe are very abundant in the Mascarin islands, especially in the Isle of France, where they are found covering the sandy plains. They have peculiar means to nourish and sustain themselves in

the most arid soils, as nature has furnished them with strong aerial roots, which descend from the stem, and bury themselves in the sandy or stony surfaces, on which they propagate themselves. These roots serve, at the same time, as so many stays or braces, to prevent the stems being blown about by the unruly winds, and as so many mouths or tubes, to suck or pump up nutriment from the unwilling soil. They also abound on the Coralline islands of the Pacific ocean, where the surface is so bare that few other plants will grow, except the Cocoa-nut palm. They are very common in the Indian archipelago, and in most tropical islands of the Old World ; but are rare in America. The *Pandamis odoratissimus* grows in *all soils and situations*, in the warmest parts of Asia, and is there much employed for hedges. Its flowers are *fragrant* and *edible* ; the leaves, 3 to 5 feet long, are composed of longitudinal tough useful fibres ; the roots also are composed of tough useful fibres, and yet are so soft and spongy, as to serve for corks. The fruit of several species is an article of food ; the branches, being of a soft spongy nature, and juicy, when cut into small pieces serve for fodder for cattle. But the fibrous leaves themselves are the most important products of the species of *Pandamis* ; many of them are beautifully white and glossy, and are handsomely wrought into elegant mats and baskets of a great variety of patterns and colors. The entire leaves hence furnish the cheapest materials, for the simplest manufactures of baling and bagging, mats and baskets, hats and bonnets ; and the propagation therefore of these plants, on the most arid soils, will not merely cover the most sterile districts with a dense population of small cultivators, but will also augment the number of an innocent, independent, and rural people, by supplying their families, their farms, and their females, with really domestic manufactures.

§ 4. *Geography of the Banana tribe, and general remarks.*

The species are natives of the Tropics, of the Cape of Good Hope, of the islands of its southeast coast, and of Japan ; and different species of Bananas are cultivated up to 33 or 34 degrees north latitude on Europe ; and one species, with germinable seeds, is now acclimated in Louisiana. In their habits of growth, they generally prefer humid or marshy soils ; several prefer shaded gullies and moist woods, and others the wettest portions of heavy forests, while one also grows on the highest mountains. The species of *Musa*, which bear the great clusters of fruits called Bananas and Plantains, have been pronounced the greatest blessing of God to man. The object of the present brief notice is to attract attention to one or more species not valuable for their fruit, nor yet for their gigantic leaves, with parallel veins diverging from the midrib to the margin ; but it is to invite special attention to the enormous petioles or footstalks, of which their columnar stems are composed, both on account of the foliaceous fibres they yield, and their value for domestic manufactures.

§ 5. *Geography of the Palm tribes, and general remarks.*

The species of this noble family of plants extend from the equator in the southern hemisphere as far as 38° in New Zealand, and in the northern hemisphere, as far as 34° 36' in the United States, and even to 43°, and 44° in Europe. Their habits of growth are as diversified as are their prod-

ucts. Some species scarcely extend beyond peculiar limits in their native country; other species have been dispersed over many lands, both by accident and by design; some spring up singly, or in clusters, over arid plains; some ascend the mountains, several occupy the shores and islets of the ocean, others love the humid banks of rivulets and streams; and others delight in miry marshes and swampy forests. It is probable that the number of species thus scattered over the face of nature will be found to amount to one thousand or more; although not more than 175 are actually described, of which 119 are American, 42 Indian, and 14 African species. The properties and products of the Palms are of the most essential and most diversified utility to man in all countries, where they follow or precede his footsteps. They yield flour and yeast, sugar and wine, oil and vinegar, milk and butter, wax and resins, fruits and medicines, utensils and weapons, thread and cordage, paper and clothing, furniture and habitations. The present remarks are however intended solely to invite public attention towards the Ticu Palm of marshy spots in Brazils, to the Morriche Palm of the inundated delta of the Oronoco; and to the Gomuty Palm of marshy forests, in the Indies, especially in reference to the value of their leaves and fibres for textile materials and domestic manufactures.

SISAL HEMP.—AGAVE SISALANA.—PINE-APPLE TRIBE.

1. There are *many species* of Agave and of analogous fleshy-leaved plants, *natives* of the New World, besides the Agave Americana, and other species, naturalized in the Old World, which can readily be distinguished, either by the external characters of their leaves alone, or by still more important differences in their interior organization.

2. There are numerous species of Agave whose *green living leaves* yield valuable *foliaceous fibres*, differing both in quantity and quality; but the species which are cultivated in Yucatan for those fibres alone are the most valuable fibrous-leaved species whose history is accurately known. 3. There are one or more species which are cultivated on the Mexican mountains solely for the inebriating juice of their undeveloped stalks; but the leaves of these species do not yield valuable fibres either in quantity or quality, which would justify their cultivation for their foliaceous fibres alone. 4. The Agave americana of Europe is not the same species as the FIBROUS-LEAVED *Henequens* of the hot low lands of Yucatan; nor is it yet the same species as the JUICY-STEMMED *Magueys* of the cool highlands of Mexico; nor does it even belong to the same genus as the *pita-leaved Ixtla* of the shady forests of Goazacoalcos; and hence that the contradictory Humboldt and his credulous copyists have perpetrated pernicious errors in attributing the *three* different Mexican substitutes for the Vine, the Hemp, and the Flax of Europe, to *one* distinct species of Agave, itself naturalized in Europe during centuries.

4. Although the flattering illusion of a wonderful combination of opposite properties in one and the same plant is now necessarily destroyed, yet the best species of the juicy-stemmed Agaves, and of the coarse fibrous-leaved Agaves, and of the fine fibrous-leaved Bromelias, all merit an immediate introduction and extensive propagation in Florida, and a gradual acclimation throughout the worst arid soils of all our Southern States.

5. There are wild species of fibrous-leaved *Agaves* indigenous to Florida; and the Mexican species sent there by H. Perrine in 1833 have become domesticated and propagate themselves. One dry coral rock, called *Bamboo*, takes its misnomer from the tall flower-stalks of the Florida *Agaves* which cover it. 6. There are various other species, and probably various valuable varieties of different species and genera of fibrous-leaved plants existing on different portions of the American continent and islands, which merit introduction to an acclimating nursery in tropical Florida, in order to determine on a small scale the peculiar and relative value of their foliaceous fibres. 7. The *Agave virginica* is indigenous to our worst soils, in the Southern States, as far as the Potomac. Several species, under the vague name of *Agave americana* have become wild on the worst soils of southern Europe, as high as Switzerland. In Spain, under the name of *Pita*, they speak of one species whose *succulent leaves* are eaten by cattle, and under the name of *Cabuya*; of one other species, whose *fibrous leaves* are used for cordage. The former is probably a *Magüey de Pulque* of Mexico; the latter a *Henequen de Sosquil* of Yucatan. Hence, if the *Agave virginica* itself does not contain valuable fibres in its leaves, there is every human probability that the fibrous-leaved species of Yucatan may be gradually acclimated as far north as Maryland; and the juicy-stemmed species of the Mexican highlands may gradually extend into even the Alleghany mountains.

The peninsula of Yucatan embraces the worst soils of any province of Mexico. It is principally composed of arid, cavernous limestone, and has not a river, brook, or spring within several hundred miles of the coast, beginning at Campeachy and running thence north to Sisal, east to Cape Catoche, and south down to Bacalar. Nature has, however, compensated the aridity of both soil and air by bestowing upon the indolent inhabitants very valuable plants, principally composed of large succulent leaves, or long fleshy and fibrous leaves, which propagate themselves both on the stony surfaces of the interior and the sandy shores of the coast. Those species and varieties whose living leaves yield superior substitutes for hemp, are the most remarkable, and the plants themselves are embraced by the natives under the generic name of *Henequen*. As the Spanish *j* has the sound of our *h*, the white or Spanish Mexicans frequently write the common name thus, *Jenequen* for *Henequen*. The coarse foliaceous fibres obtained from the green leaves of all the species are called by the generic name of *Sosquil*. The equivalent to this Mexican term for coarse foliaceous fibres is generally *Grass-hemp* in the mouth of an American. There are two varieties of cultivated *Henequen*, called *Yash-qui* and *Sac-qui* by the natives; or the Greenish *Henequen* and the Whitish *Henequen* in the translation of the Spaniards. Both these are embraced by me under the denomination of *Agave Sisalana*. Taking the *Yashqui* for the type, its generic characters are as follows: Corol bell-form; segments converging and longer than the tube. Filaments very long, awl-shaped, and inserted into the base of the segments at or near the top of the tube. Style not half as long as the stamens, and is even very little elevated above the segments of the corol when its three-lobed stigma receives the pollen from the bursting anthers. The corol, stamens, and style continue all permanent on the germ; and the germ itself becomes a cylindrical capsule, which, opening at the top in three divisions, even splits the dried tube of the corol. Its specific character is sufficiently denoted by the smoothness

of the edges of the leaves of the Yashqui. Indeed, when very young, it greatly resembles our indigenous Petre, or *Yucca gloriosa* of the Southern States. The leaves will average three feet long, yet they are frequently five feet long, with a thorn at the point. I once took the exact dimensions of a leaf five feet long. At fifteen inches from the point it was four inches wide and one-eighth of an inch thick; at thirty inches it was five inches wide and two-eighths of an inch thick; at forty-five inches again only four inches wide, but three-eighths of an inch thick; and at radical end merely three inches wide yet four-eighths of an inch thick. It will grow in any arid soil or situation and propagate itself without cultivation. When the young plants are placed at six feet apart, the mature plants, after the second or third year, will produce, at the very least, 1,200 pounds of Sisal Hemp per acre. If it be the Sacqui, it will produce double that quantity. Two or three files of the lowest leaves may be cut two or three times yearly from the same plant, at any season, for several years, and forever from the shoots which supply its place. From the letter of Don Santiago Mendez, Vice Governor of Yucatan, sufficient data can be obtained to calculate the profit of a plantation of Sisal Hemp. The paper of the Henequen Plant Company of Yucatan calculates the expense and profits of 36,000 plants as follows: Total expense at the end of three years \$4,541; total produce of the third year \$9,015; divisible gains \$4,479.

Admitting, however, but 1,200 pounds of Sisal Hemp per acre. The Indians of Yucatan scrape it out on shares, *i. e.* they cut and scrape the leaves in their rude way, and receive one-half of the fibres for their labor. It is to be inferred that in the United States the fibres could be separated as cheaply by labor-saving machinery or management. Six hundred pounds of Sisal Hemp per acre would be the nett proceeds of the proprietor; and I venture to say that, at this rate, it will yield 100 per cent. more nett interest on the capital and labor employed than is now yielded by sugar or cotton.

OTHER FIBROUS-LEAVED PLANTS OF THE PINE-APPLE TRIBE.

Pita de Guataca.—This plant grows wild in the greatest abundance, in the vicinity of the village of Guataca, in the province of Carthagena, where its leaves attain a length of 9 to 12 feet, and a thickness of 3 to 4 inches. These leaves are linear-lanceolate with recurved spines along the margins. The fruit is a triangular one-celled capsule, with few seeds. The leaves exceed in length those of the *Bromelia penguin*, and of the *Bromelia karatas*, both common plants in the West Indies; but in length and strength of foliaceous fibres, the *Pita de Guataca* excels both. It was introduced into Jamaica in 1831, with the view of propagating it in the dry sandy savannahs of that island, which are at present uncultivated and unproductive. This fibrous substitute for hemp is preferred to common hemp, on account of its superiority in lightness, strength and durability, especially under the influence of water or moisture. In point of *offal*, compared with common hemp, the advantage is enormous in favor of the *Pita* hemp. It has been calculated that three tons of *Pita*, will make as much cordage, sail, or other cloth, as fifteen tons undressed hemp. In 1834 the quantity of hemp and flax, from Russia into England alone, was estimated at 25,000 tons; and that by substituting *Pita*, at least 74,000 acres

of the actual wastes of the West India colonies would be put under lucrative culture. As to the difference in weight, between equal bulks of Pita and common Hemp, Dr. Hamilton has ascertained it to be one-sixth in favor of the Pita; and hence, taking the weight of the standing and running rigging of a man-of-war made of hemp at twelve tons, a reduction of two tons in the top weight, would be effected by the substitution of Pita. Under the operation of the emancipating laws in the British West Indies, the white planters will be forced to propagate fibrous leaved-plants on their poorest soils, especially because in their preparation for market, horse power can be substituted more profitably and certainly for human power. Dr. Hamilton supposes this Pita de Guataca, to belong to a genus between Guzmannia and Pourrettia. He speaks also of another plant, called Pita de Tolu, which grows in large quantities at Tolu, is probably a species of Agave, and yields coarser, browner, or inferior fibres.

By the "Maison Rustique," published in Paris, 1836, it appears that attention is directed to the American species of Agave, naturalized in the south of France, and in the north of Africa. Porteau says, "Mons. Pavy has recently introduced, under the name of *Vegetable Silk*, a very beautiful filamentous substance, which he declares to be of the Agave, and to come from the territory of Algiers." He adds, that the cordage made of this silky fibre is very strong, and resists humidity perfectly; and that the same remarks apply to many other objects manufactured of it. Under date of 2d January, 1833, Wm. Shaler, the consul general at Havana, wrote to H. Perrine at Campeachy, as follows: "I have many years since been aware of the species of Aloes which you are seeking to introduce into Florida as a material of manufactures, which I pointed out in a letter to Mr. Poinsett, before his departure for Mexico. I have found it growing abundantly on the arid lands of California, and subsequently in Algiers; and it seems to me that it must flourish throughout Florida, and become a valuable item in its exports." Shall the English and French alone produce foliaceous fibres on their poorest soils?

H. P.

SISAL HEMP.

To the Señor Don Santiago Mendez, Vice Governor of the State of Yucatan.

CONSULATE U. S. A. AT CAMPEACHY,

February 8, 1834.

MY DEAR SIR: Desiring to have the very respectable testimony of yourself, concerning the culture and product of the *Henequens*, or species of Agave, whose leaves yield the fibres called *Sosquil* in Yucatan, and *Sisal hemp* in New York, I beg that you will communicate to me the most important and unequivocal facts, in the following order:

1st, the soils in which said Henequen grows; 2d, the distance apart of the transplanted shoots; 3d, the time previous to the first crop of leaves; 4th, the number of cuttings each year afterwards; 5th, the number of leaves annually cut; 6th, the relative quantity of fibres in the leaves; 7th, the duration of each plant; 8th, the reproduction of said plants.

I have the honor to be, sir, very respectfully, your obedient servant,

HENRY PERRINE.

[Reply.—Translation.]

CAMPEACHY, *February 9, 1834.*

MY ESTEEMED FRIEND: In order to furnish you the requested intelligence concerning the Henequen, I will limit myself to that variety called Sacqui, which is the most cultivated; and therefore I say:

1st, that it produces itself, and flourishes on the stony lands of the interior, as well as on the sandy shores of the coast; 2d, that the plants are placed from 4 to 2 Spanish yards apart, according to the lands; 3d, that the shoots, (children,) being one Spanish yard high, when transplanted, they yield at two years afterwards; 4th, that twice or thrice yearly, there may be cut from said plants, two or three rows of leaves, on any day of the year; 5th, that the number of leaves cut each year, is not less than 25 nor more than 100 on each plant; 6th, that to obtain one pound of fibres, from 8 to 24 leaves are necessary, the most productive being those of the fourth annual cutting; 7th, that the cultivated plant lasts from 10 to 15 years; 8th, that every two years it throws out from its roots, from 5 to 10 shoots, (children,) in a state to be transplanted. Furthermore, when the plant is aged, it forms a flower-stalk, from 8 to 10 Spanish yards high, whose superior extremity becomes covered with innumerable miniature plants, (Henequencitos.)

I remain your affectionate friend, &c.

SANTIAGO MENDEZ.

Señor Doctor HENRIQUE PERRINE.

CAMPEACHY, *January 8, 1835.*

SIR: Our Grass Jenequen, or Sósquil, is principally used by all the Mexican vessels, especially for cables, in which they place all their confidence. The port of Vera Cruz is dangerous, and a cable made of this grass is considered by all the captains to be far preferable to the best hemp or chain cable; being light and springy, there is no strain on the vessel, and they confide so much in them, that the Campeachy vessels instead of seeking shelter under the castle of San Juan de Ulua, that they prefer dropping their anchor ahead of all the foreign vessels, so as to keep themselves clear of being fell afoul of by them. A Campeachy cable is allowed to last out two of hemp cables. The short duration of hemp in this bay is occasioned by the heat of the water, which rots the hemp in a very short time. A grass cable as soon as it gets a good stretching and use, ought to be given a new coat of tar, which is considered absolutely necessary, and preserves it from rotting. The *Jenequen* is also used for warps; being light it swims, and of course is not so liable to be entangled as the hemp is; and it is almost incredible how they *give*, which is a great help in towing or wharping up a river. Running rigging is also much used, especially for vessels, sheets and halyards. For a winter's coast it is not so much calculated, as the cold makes it stiff and very impliable for the hands. This is the greatest objection the other nations can have to it: another objection is, that when once it is worn out, it is good for nothing, (except paper,) and the hemp is at last made up in oakum.

However, the lightness of the grass makes it come very low, and the

great difference in price is no doubt a great object. When the ropes get a little used, it is always well that a slight coat of tar and tallow be given; it preserves them from getting mildewed and prevents rotting. For small lofty sails no doubt the Jenequin is preferable, being so very light and pliable; for standing rigging it will not answer by any means, as it gives too much.

I should think it would be excellent for making paper, I have also seen made here such stuff as is used for musquito-bars, which no doubt is very durable.

I am, respectfully, your most obedient servant,

JNO. L. MCGREGOR.

To HENRY PERRINE, Esq.

BROMELIA PITA.

Extract of a letter to the Secretary of the Navy, dated

CAMPEACHY, November 10, 1834.

"The specimens of Pita, in their imperfectly-cleaned condition, will suggest the special uses which may be made of them after perfect dressing. It is, indeed, passing strange that an article which has been propagated and prepared, from time immemorial to the present date, on the southern border of the Mexican sea, should not yet have attracted sufficient attention, either in Mexico or other countries, to ascertain the species of the plant, or its habits of growth.

"In the statistics of Vera Cruz, published in Jalapa in 1831, it is stated that, in 1830, there were exported from Goazacoalcos, for that port alone, 943 bales of Pita, of 200 pounds each, or 188,600 pounds. Although the poor Indian cultivator, or propagator, often receives only 6½ to 12½ cents per pound, yet, in Campeachy, whole cargoes are sold at 30 to 37½ cents a pound. The same statistical compilation states that in 1830, there were in the department of Acayucam 1,231 Pita-patches, around several villages, and that the propagation of the plants, and the preparation of the fibres, were augmenting every year; while the cultivation of cotton, in this the finest country in the world for its perennial production, was declined to the lowest degree. To the subscriber, this voluntary transfer of the labor of indolent Indians from Cotton to Pita, is the strongest possible evidence in favor of the superior productiveness of the latter, with a given amount of labor. The cultivation, or rather propagation, of the *Istle*, can be effected more readily than the propagation of the *Henequen*, in Florida, as the latter requires that the land should be entirely cleared, and the former is content to occupy the place of the undergrowth in forests of enormous trees. Samuel Baldwin, a rugged Pennsylvanian, who arrived at Goazacoalcos in 1825, and who brought cargoes of *Pita* to Campeachy, gave me the following information relative to the *Istle*, which has been confirmed by other residents of Goazacoalcos."—[See the letter of S. Baldwin.]

Extract of a letter to the Secretary of State, dated

CAMPEACHY, November 23, 1834.

"As the natives never receive any article in return but silver, and as they never spend any money they receive, (their clothes being made by their women, and their intoxication being effected by the *chicha*, fermented from their own maize,) it is calculated that since the first notice of the exportation of these fibres, their predecessors must have *buried*, of their value alone, a total amount of 2,825,000 dollars, which have never been of any service to their ancestors nor themselves; and may never be of any utility to their posterity or the world. From the abundant data already communicated by the subscriber, it may be calculated that foliaceous fibres of the Henequen and Istle alone may be produced in the barren sands and in the idle woods of the South, much more profitably than the cortical fibres of the hemp and flax can be cultivated in the fertile fields of the West—than even the capsular fibres of cotton, in the rich alluvions of the Southwest. If South Carolina will even cultivate her indigenous *Yucca filamentosa*, he will promise her, with the rotary scrapers of Perrine, to separate foliaceous fibres from its fresh green leaves; a gift as favorable for her agricultural prosperity as were the rotary pickers of Whitney to separate capsular fibres from their ripe dry seeds.

"N. B.—The native names of the forest Pine-apple plants are written both *Istle* and *Ixtla*: the names of the fibres are written either *Pita*, or *Pitafoja*."

OTHER FIBROUS-LEAVED SPECIES OF BROMELIA.

Besides the common Pine-apple, (*Bromelia ananas*), other species have edible fruits; but, as far as my observation extends, the more valuable they are for edible fruit, the less valuable are they for their fibrous leaves. The *Piñuela* of Yucatan, much prized for its clusters of very acid fruit, has no valuable fibres in its leaves. It nevertheless serves very well for hedges. The Penguin is very common in Jamaica, in most of the dry savannahs and on the rocky hills, where it is used for fencing pasture lands, on account of its prickly leaves. "These, stripped of their pulp, soaked in water, and beaten with a wooden mallet, yield a strong thread, which is twisted into ropes and whips, and manufactured into a good cloth." The juice of the fruit of both species makes a cooling drink for fevers, extremely diuretic and vermifuge. In Brazil, three species of *Bromelia* are prized for the valuable fibres contained in their leaves, whose provincial names are *Grawatha*, *Carou*, and *Crauta de Rede*. Dr. Arrude gives the botanical names for the last two, *B. variegata* and *B. sagenaria*. The former is found in great abundance in the Sertoens de Paraiba, and of the northern provinces. The fibres of the leaves are of two kinds: from one, a very strong cordage is made; from the other, fishing-nets and a very coarse cloth are manufactured. The latter is confined to the maritime parts of Pernambuco and Paraiba. The leaves are from six to nine feet long. The foliaceous fibres are so very strong, and at the same time so very fine, that cables are made of them much superior to those of Europe in strength and elasticity, while these fibres are equally well adapted for sail-cloth, or for stockings.

The late E. Roberts, our ministerial agent to the Eastern hemisphere, while at Manilla, speaks of a manufacture as fine as cobweb muslin, used by the natives for ornamental shirting, and which he declares to be the most beautiful fabric in the world. He calls this fine web by the name of Piña, which is simply the Spanish word for Pine-apple, and was doubtless intended solely as an adjective adjunct, to denote the plant from whose leaves the fibres were obtained. As very fine foliaceous fibres are obtainable from the thin, dry, long leaves of many species of true Bromelias, or brethren to the edible Pine-apple, they are probably converted, in the East Indies, to the manufacture of those fine glossy substitutes for linen and muslin, called Grass-cloth. Fine foliaceous fibres, in general, are called Grass-flax, or Grass-silk, Tropical Flax, Vegetable Silk, &c. As a general remark, these fibres are best obtained by the mechanical process of simple scraping only of the green living leaves. All maceration, rotting, or decomposition, however useful for the reticulated structure of the barks of common flax and hemp, are injurious to the strength of the parallel longitudinal fibres of living leaves of endogenous plants. There is no doubt in the mind of the subscriber, that all the valuable species of Bromelia can be profitably propagated on even the natural, uncleared, arid surfaces of tropical Florida. By the letter of J. Dubose, it will be seen that the Bromelia Pita of Goazacoalcos, sent in 1833, continues propagating itself in the vicinity of Cape Florida.

HENRY PERRINE.

WASHINGTON, *February* 10, 1838.

BROMELIA PITA.

GOAZACOALCOS, *April* 1, 1832.

DEAR SIR: I have taken all the pains that I could to learn the manner of cultivating the Pita of this place. The Indians hunt for a thick wood of large timber, and cut the small growth of timber down and burn it; they then plant the small plants about six feet distant from each other, and in twelve months they cut it to rasp. If it is not cut for two or three years it makes no difference, on the contrary it is better. When the Pita is young, they cut it, and make very fine and white fibres. When three years old, the Pita is long and coarser. There are three different kinds of Pita: one kind has many thorns, the second kind has but few thorns, and the third kind has none at all. I believe the cause of its not having thorns, is owing to the cultivation. Their manner of cultivating it, is to cut the weeds once in twelve months. The plant springs from a running root of the old plant. After the ground is planted one year, it becomes as thick as a wheat-field in appearance, so that it is impossible to walk through it without cutting a road. It has a large blossom, like the Pine-apple, but close to the ground, and has a small seed. The Indians tell me it takes three years to grow, and they have promised me to get some seed for you. Under the flower there grows a small bunch of *pits*; these the Indians make use of as a drink. They bruise them, then put them in water, and it makes a fine drink, fresh and tartish to the taste. The Indians have about five acres to a family, which gives them work for the year. The Pita that one man rasps, is four pounds per day. A gentleman here tells me that he rents his Pita gardens to the Indians for two bales per

year. He has 500 acres of Pita to let to the Indians. He gets about \$50 per year for his Pita, [in each garden.] His name is Lusana de Toris. I came to Goazacoalcos in 1825; the Pita then brought a fine price, three bits per pound and quick sale; now it is one bit per pound and dull sale. I think in one year more it will be sold for 6½ cents per pound. All the thread for sewing here is made by hand by the Indians. I myself made a rope of the Pita for the use of my saw mill, that proved much stronger than one of hemp of the same size, and lasted longer. I have no more to say on the Pita.

I remain your most affectionate friend,

SAMUEL BALDWIN.

Mr. HENRY PERRINE.

It is my opinion, if the Pita was cultivated by people that know how to take hold of work, it could be sold for one cent per pound, and the laborers would make a good living at that. The labor (of cultivation) is much less than flax or hemp, for there is no use of cattle, ploughs, or fences. It can be planted in the woods apparently wild.

SAMUEL BALDWIN.

LILY TRIBE.

Phormium Tenax: Flax Lily of New Zealand.—Ever since the first voyage of Captain Cook, all voyagers have concurred in testifying to the immense utility of this plant among the natives of the countries where it spontaneously grows. During the same period it has occupied the anxious attention of all intelligent men, who with the eyes of patriotic statesmen contemplate the important changes which will be effected by this single plant in the agriculture, manufactures, and commerce of all civilized nations. Until recently, at least, all attempts to cultivate this flax lily in the open air of England have failed. At Charleston, South Carolina, in August last, I found it in a vigorous condition, and was informed that it has flourished several years in the open air. In Paris its vegetation is not vigorous, and it is sometimes damaged or killed by rigorous winters; but in all the southern departments of France it vegetates vigorously, and never suffers from cold. Although hitherto propagated by suckers or by division alone, all southern France is becoming covered with the progeny of a single plant introduced about 40 years ago. In 1791, Labillardiere started as a botanist in the expedition of d'Entrecasteau, designed to seek the unfortunate LaPeyrouse, and returned to France in 1798, with several plants of the New Zealand Flax Lily, but when in sight of the coast, all his collections were captured by the British. Nevertheless, shortly afterwards, Acton, the director of the garden at Thew, remitted a single shoot to Thouin, at the Garden of Plants in Paris. As Thouin was duly impressed with a deep sense of the great importance of this single plant, he distributed all its progeny, as fast as they appeared, to many different portions of France; and for this persevering labor alone he should have a monument erected to his memory. It is stated that Marshal Clausel has introduced the culture of the *Phormium* into Algiers, and it may be confidently predicted, that within a few years more, France may extract folia-

ceous fibres from her acclimated Phormium and her naturalized Agaves as superior substitutes for flax and hemp, both for home consumption and foreign exportation. The strength of the fibre of the Flax Lily compared with that of common flax and hemp has been ascertained to be as follows: New Zealand flax 23 $\frac{1}{2}$; common hemp 16 $\frac{1}{2}$; and common flax 11 $\frac{1}{2}$. The relative strength of Silk itself is expressed by the No. 24. The natives of New Zealand obtain the foliaceous fibres from the green leaves of the Flax Lily by simple scraping only, with muscle-shells and their nails; yet this simple process obtains fibres both stronger and handsomer than any more complicated process devised by the Europeans.

Since 1827 several English mechanics have spent much capital and power in attempts to make use of this plant; but it is said they did not succeed in ridding it of the resinous matter it distills so as to soften it enough for easy weaving. But it is now asserted by the French papers, that a Monsieur Leonard has just regulated and brought to perfection the attempts heretofore stationary among the English. He has established at Port Remy a large manufactory of the Phormium tenax, which then employed more than one thousand workmen, and it was anticipated that before many months the number of workmen would be necessarily increased to 300 persons.

Before being brought to a weaving state, this plant goes through seven operations, which are so little costly, that all included, even to the combing, does not amount to six francs the quintal, (i. e. \$1 20 per 100 lbs.) It is reasonably contended that this plant will be to France more important for manufactures than cotton is to England. Without entering into further details, the subscriber wishes to attract public attention that the Phormium lenax can be profitably propagated on the worst soils of Florida and of all our Southern States.

There are five species of Yucca indigenous to the worst soils of our Southern States from the Potomac to the Mississippi; and there are two species of Yucca now acclimated in several Northern States. The botanical names of the five Southern species, are *Yucca filamentosa*, *Y. gloriosa*, *Y. aloifolia*, *Y. angustifolia*, and *Y. recurvifolia*. The common names and synonyms for the *Y. filamentosa*, are, Bears-grass, Silk-grass, Evesthread, and Everlasting. The very filaments on the margins of its leaves are nature's signs of the fibrous treasure within them. As these leaves are thin and flexible, they are used entire for straps and strings, and when twisted and tied together they serve for ropes and even cables of small boats. Elliot, in his Botany of South Carolina, says: "It appears to possess the strongest fibres of any vegetable whatever, and if it can be raised with facility may form a valuable article in domestic economy." The leaves of the *Y. gloriosa* are stoutest and fleshier, and abound in strong fibres; indeed, it is a dwarf representation of one species of the Sisal Hemp plant. The *Y. aloifolia* differs principally in the margins of the leaves being rough or sawed, while the edges of the leaves of the *Gloriosa* are smooth. Both however have a thorn at the point of their leaves; and both are frequently known under the common names of "Adam's needle, Spanish bayonet, *Petre*, and Palmetto.

In the report No. 454 of the Committee on Agriculture, in April, 1832, at page 11, is an account, by Judge H. Breckenridge, of Pensacola, of a fibrous-leaved plant resembling the Bouquet Palmetto, said to be the same as the Pita cultivated in Campeachy. He says "it grows in great abun-

dance even in the poor sandy pine lands; it can be easily transplanted, will bear to be cut once a year, and will in that period attain the former size or even greater; being perennial, a plantation once made will last for years; a thousand plants to an acre would produce one pound each, and that as it requires but few hands it must afford immense profits to those who first engage in its culture." As Judge B. is doubtless speaking of an indigenous *Yucca*, accurate trials should be made of the relative value of all the indigenous species, and exotic species should also be included.

The *Yucca acaulis* of Cumana has so much the aspect and habit of an Agave, that it is there called Maguey de Cocuy or Cocuiza, and from its leaves are doubtless obtained the celebrated fibres of Colombia, whose name is written Coquise by foreigners. Lieutenant Bache says that there the name *Pita* is given to the fibres of a tree called Marichi, that these fibres are 10 to 12 feet long, and finer and more silky than those of the Agave. Under the head of Palms it will be seen that this fibre is likely obtained from the *Mauritia flexuosa*. Under the names *Yucca Boscii* vel *Agave filamentosa*, there is now in French gardens a fibrous-leaved plant which merits introduction into the United States.

Should the Committee on Agriculture determine to have lithographed the drawings of fibrous-leaved plants which should accompany their report, their appearance for illustration will compensate the brevity of detail to which I am forcibly limited.

It is nevertheless trusted that enough has been said to excite effective encouragement to the propagation of fibrous-leaved plants on the poorest soils of all the United States, as far north as they will profitably grow.

BANANA TRIBE.

Our botanists tell us that the *leaves* of species of Banana or Plantain yield a kind of flax, of which the finest muslins are made. Our commercial and geographical books tell us that the fibres called Manilla hemp are obtained from the *bark* of the same species of wild Banana which fill extensive forests in the marshy Philippines. A naval officer has asserted that the Manilla hemp is obtained from the *bark* of a species of Palm. If due attention has been paid to the introductory facts relative to the Banana tribe, and the Palm tribe, it will be seen that these assertions are absurd. Palms have not any proper bark; Bananas have not any proper stem; and the structure of the leaves of the Banana will show that they cannot yield fibres valuable either for length, strength, or quantity. The petioles of the Banana leaves, which compose the column called the Banana stalk, do, however, contain parallel and longitudinal fibres; yet in most species of the fruit-maturing species these fibres are not valuable for thread or cordage. Even in these cases, nevertheless, the foot-stalks may be rendered valuable for simple manufactures of matting or baling, as exhibited in the envelopes of cloves from the East Indies.

I have exhibited to the Committee of Agriculture one petiole of the common Banana, which foot-stalk of a leaf measures 10½ feet long, by 4 inches wide. Hence the importance of the fact that a small species of Banana is now acclimated in Louisiana; that it can be spread by seed, as well as by suckers, along the marshy borders of the Mississippi. These

seeds the committee have seen ; they are still on their table ; a portion have already been distributed, and the remainder are intended for general distribution by the subscriber. Nevertheless the fibres of the petioles of even the common Bananas and Plantains known in the West Indies, have been thought worthy of legislative encouragement in Jamaica : one hundred pounds premium being offered by the Assembly for the best specimen of this petiolar hemp in each county. One premium was gained by Dr. Stewart West, for the best specimen produced in the county of Surry, about thirty years ago. He also gave the form of a very simple and cheap machine, by which he effected the separation of the cellular substance from the fibres. As emancipation deprives the whites of a command of labor for their ancient staples, it is highly probable that the assembly will soon encourage again the production of petiolar hemp, from certain species of the Banana tribe ; especially as the people are actually introducing, from Carthage, the fibrous fleshy-leaved plant called Pita de Guataca. About fifteen years ago, the attention of the Horticultural and Agricultural Society of the East Indies was attracted towards the production and preparation of Banana hemp. Several communications were read to the society. All parties spoke highly of the topic ; but the subscriber has not had the means to ascertain what progress has since been made. About six years ago, a paper appeared in a French journal, entitled " Notice concerning a new Textile material, which can be profitably produced in the colony of Algiers," read before the Royal and Central Society of Agriculture, by Jerome Saint Hilaire. In this paper Saint Hilaire gives an imperfect account of a wild Banana of Manilla, called the Abaca, and recommends the propagation, in general, of the species of Banana, for the fibrous materials afforded by the petiolar lamina of their stalks. It appears that public attention, in Paris, had been attracted by the manufacture of stuffs very remarkable for their splendor, being as brilliant as those of silk. The great success of the first manufacturer of an unknown staple induced rivals to engage in the same business ; and, by the lawsuit which ensued, the secret was made public.

The most able Botanists appointed to examine these new fibres were greatly puzzled in their attempts to ascertain the kind of plant, and the part of plant, from which they were obtained. At first it was supposed that they were the foliaceous fibres of the leaves of the *Phormium Tenax* or Flax Lily of New Zealand, even then extensively multiplied in France. As, however, these glossy-white fibres, under the name of Abaca, were proved to be imported from the East Indies, inquiries were made of Mons. Perrottet, the botanical agricultural voyager of the French Government, to whom Europe and America are indebted for the importation of the *Morus multicaulis*, from Manilla, and to his letter of the same period, is the world indebted for the most exact knowledge of the fibrous Banana of the Philippines that ever has been published. During four months' stay at Manilla and its vicinity, he had opportunities to know exactly the plant itself ; the simple manner of extracting its fibres ; and the usages for which the fibres were generally employed. He, furthermore, brought with him to the Garden of the Museum in Paris, several living individuals of this interesting Banana ; and, in 1821, he published a catalogue of all the plants introduced by him, including, at page 42, this valuable plant, under the name of *Musa abaca*. To extract the fibres, he says that the natives employ three different processes :

2d. Their extension on a humid soil, under the shade of large trees, and turning them occasionally during several days, until their cellular substance be decomposed or destroyed.

3d. The mechanical crushing or bruising of the petiolar stalk or lamina until the utricles be destroyed, the juices expelled, and there remains solely a mass of fibres, which can be cleaned by washing.

Mons. Perrottet, however, has discovered one fact relative to the extraction of the petio-foliaceous fibres which is applicable to all Endogenous plants whose leaves or petioles yield valuable fibres. That important fact is, that maceration, rotting, or decomposition, of the cellular substance of the leaves or of the petioles, does really weaken or destroy the *parallel longitudinal fibres*; and that hence speedy mechanical separation or scraping is the simplest and the only mode to obtain foliaceous or petio-foliaceous fibres of the greatest strength, whiteness, and brilliancy. The fibres called Manilla hemp, in common with the fibres called Sisal hemp, are stronger, lighter, more durable, and more elastic, than the fibres of common hemp. Until November last, the subscriber was not positively convinced that the long coarse fibres, called Manilla hemp, were obtained from any species of Banana; but some imperfectly dressed fibres, which retained the cuticle of the petiole, and some straps of the petioles themselves, of two different colors, have dissipated his doubts, and he trusts, also, the doubts of the committee.

Our ministerial agent to the East Indies, Mr. Roberts, under the head of exports from Manilla, spells the name of the fibres in three different ways: Abacia, Abacá, and Avacá; and states that the production and export of the Manilla hemp has greatly increased in a few past years. The great recommendation of this plant to the subscriber is two-fold: first, that it will propagate itself in the marshes of tropical Florida, and secondly, that its fibrous crop can be obtained within a year from the transplantation of the suckers.

The very fact that this Banana is propagable by suckers alone, in common with the Agave of Sisal, places the transportation of either beyond the means of individual enterprise, especially as the inhabitants both of the Philippines and Mexico would interpose obstacles to the acquisition of a cargo of living plants by any private foreigner.

PALMS.

The Rev. R. Walsh, in his travels through Brazil during 1828-9, discovered the Ticu Palm growing in *marshy* spots. This fibrous-leaved palm, (the *Bactris acanthocarpus*,) the Brazilians are beginning to use as a *substitute for flax and hemp*. "The leaf is *long*, and exceedingly *fibrous*, covered with small spines. When bent in the middle, the ribs of the leaf, which are very brittle, crack and separate; the ends are then drawn down at each side, and leave a series of strong fibres of the best quality behind them, which are very applicable to the purposes of manufacture. The tree is from 15 to 20 feet high, and the stem is as thick as the wrist, divided into joints, with a circle of spines around each. It yields also a cluster of acid fruits on the summit of the stem; each fruit consists of a stone, covered over with a pulp, and enclosed in a purple skin, so that the cluster is very like a bunch of grapes. The fruit is cooling and agreeable in a hot day, and is sometimes made into vinegar. The

stone exactly resembles a cocoa-nut in miniature, and contains a kernel within it also. It is sold in the streets of Rio, and is called the Cocoa Ticu."

The Gomutus, or black-rope Palm of swampy woods in the East Indies, is asserted to be the most valuable substitute for flax and hemp, discovered by the celebrated Doctor Roxburgh. Under his superintendence, it was extensively propagated in the dominions of the East India company, and its propagation was warmly encouraged by the British Government itself.

The native names of the *Palm itself* are written Anau and Anou; and their names for the *black fibres*, are written iju and ejoo. From these horse-hair like fibres are made the cordage called Black-rope, and Palm-tree cordage. "Each tree produces six leaves in the year, and each leaf yields ten and a half ounces of the fibres, which makes the annual produce of each palm nearly four pounds. Some produce full one pound of the fibres in each leaf. They grow from the base of the footstalks of the leaves, and embrace completely the trunk of the tree. The fibres and leaves are easily removed without injuring the tree." Thus says Roxburgh, Trans. Soc. Arts, Lond. vol. 24, p. 152. Crawford says: "It is used for every purpose of cordage in India, domestic and naval; and is *superior in quality, cheapness, and durability*, to the cordage manufactured from the fibrous husk of the cocoa-nut." In Ceylon, the fishermen make their lines of *single fibres*, tied to each other until of sufficient length. It also produces much sago, sugar, toddy or wine, and thatch. Botanists differ in their names, some call it Saguevis Rumphii; others, Arenga saccharifera, and also, Borassus gomutus. But the most wonderful and useful of the fibrous-leaved palms, flourishes in the inundated islands of the Delta of the Oronoco; this is the *Mauritia flexiosa*, whose native name is written three ways, viz: Murichi, Moriche, and Mariehi. Indeed, to form an adequate idea of the astonishing and diversified utility of this Palm, it is necessary to read all the details given by the Padre de Gumilla, in his History of the Oronoco. He truly calls it the tree of life of the Guaruma Indians, as they obtain all the necessaries of life from this palm alone. During one-half of the year these islands are covered by the freshets of the river, and during the remaining six months, twice a day by the tides of the sea. The dwellings or villages of these Indians are elevated on platforms made of this palm. Its trunk contains the finest farinaceous matter. Their cordage and clothing are made of its leaves.

To me, the greatest recommendation of these palms, are the facts that the first grows in marshy spots: that the second thrives in swampy woods; and that the third flourishes in the midst of the waters; and that hence they may be all propagated in similar worthless sites of tropical Florida.

H. PERRINE.

WASHINGTON, February 10, 1838.



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